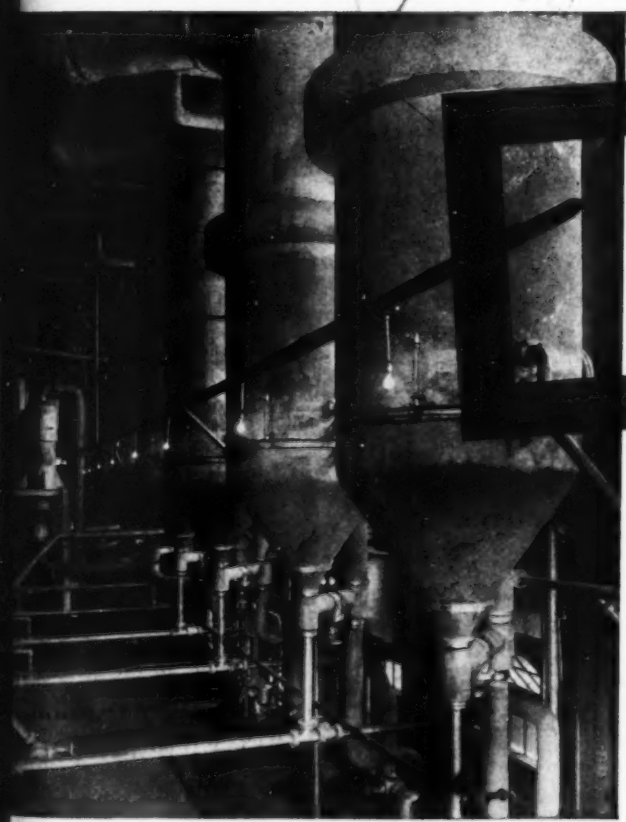
JUNE 1950

The Paper Industry

PUBLIC LIBRARY
JUN 23 1950
DETROIT

TECHNOLOGY DEPT.



More than 500,000 lb of evaporation per hour is provided by this multiple-effect Swenson Black Liquor Evaporator

Lower Cost Black Liquor Evaporation

WITH SWENSON L.T.V. EVAPORATORS Years of operation in kraft and soda pulp mills have demonstrated the economy of this equipment — low first cost, low operating cost, and low maintenance.

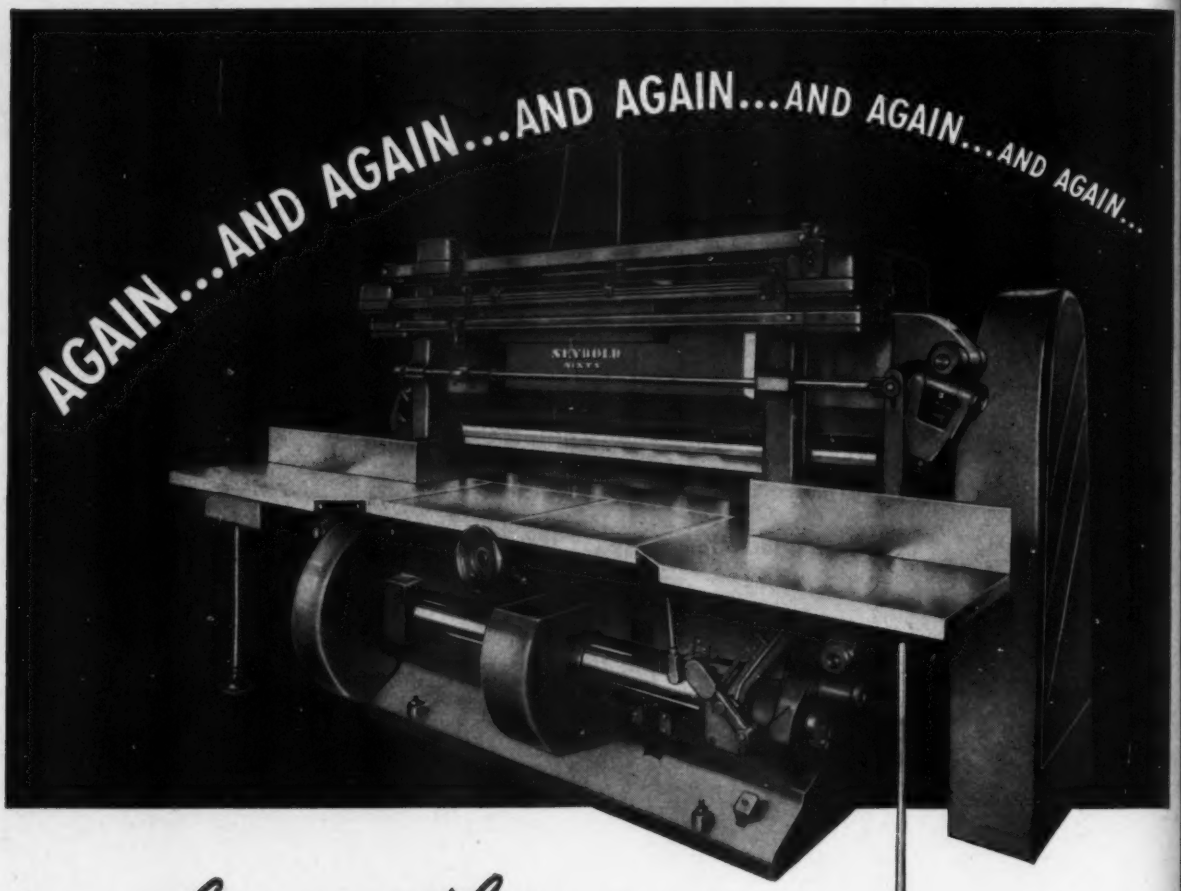
Swenson engineers with specialized experience in the pulp industry will gladly help you work out evaporation and other process problems . . . call on them while your plans are still in the formative stage.

- Evaporators
- Pulp Washers • Filters • Causticizers
- Digester Blow Condensers
- Surface Condensers
- Turpentine Condensers • Deckers

SWENSON

SWENSON EVAPORATOR COMPANY

DIVISION OF WHITING CORPORATION
15653 Lathrop Ave. Harvey, Illinois
Eastern Sales Office and Export Department:
30 Church St., New York 7, N. Y.
In Canada: Whiting Corporation (Canada) Ltd.
47-49 LaPlante Ave., Toronto 2



always the same

Repeated "gauging" is time-consuming... invites errors, and increases costs in the finishing room.

SEYBOLD has mechanized this tedious job—makes the machine do the work, not the operator. Once set, the SPACER TRIMMER goes through its routine of cuts automatically, tirelessly, quickly and accurately.

No combinations of settings are too complicated or too numerous for this machine. Dozens of settings can be carried; each one precise and positive.

Hours of time and tons of spoiled sheets are saved by this SPACER TRIMMER.

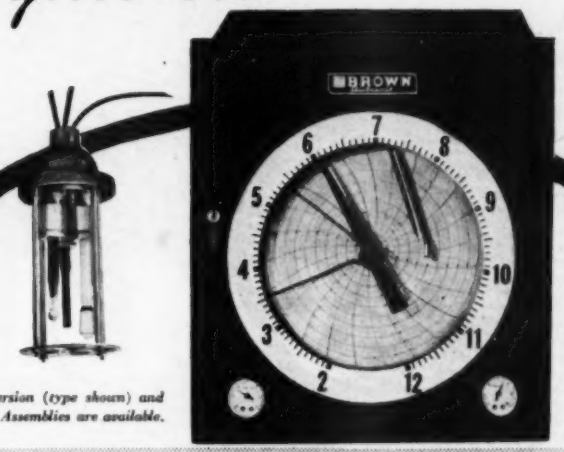
Ask your SEYBOLD representative for details, or write Dept. O.

Z-ACTION

HARRIS-SEYBOLD

4510 EAST 71st STREET • DEPT. O • CLEVELAND 5, OHIO

Set Your Sights on



Immersion (type shown) and Flow Assemblies are available.

BETTER SHEET QUALITY . . .

MORE ECONOMICAL USE OF CHEMICALS . . .

LONGER EQUIPMENT LIFE . . .

WITH THE . . . . . .

ElectroniK pH CONTROLLER

With tonnage-versus-cost as a moving target, many mill operators are loading their guns with extra ammunition . . . by providing control for every important variable. In such cases, automatic pH control is gaining recognition as a cost reduction factor . . . and justly so! Proper control of pH can have startling results. It is vital to sheet quality, to the conservation of chemicals and to the useful life of paper making equipment.

The sensitivity and speedy response of the *ElectroniK* pH Controller are responsible for the records it is setting in the paper industry. It is particularly valuable in the control of white water, stock, raw water treatment and waste disposal.

Call in your local Honeywell engineer for a discussion of its application to your processes . . . he is as near as your phone!

Write, today, for a copy of Data Sheet 2.9-33.

MINNEAPOLIS-HONEYWELL REGULATOR CO.
INDUSTRIAL DIVISION
4489 Wayne Ave., Philadelphia 44, Pa.
Offices in 77 principal cities of the United States, Canada and throughout the world

Specialized Instrumentation
FOR THE PAPER INDUSTRY

HEAT RESISTANCE + ABSORBENCY

S/AA

Asbestos for heat resistance; cotton for absorbency—Hooperwood now combines them both in a new dryer felt that will give you longer service, lower dryer felt cost.

Top surface warps of high tensile heat-resisting asbestos yarn weave directly through the felt, offering natural channels for drainage. A layer of absorbent cotton warps underlays the asbestos to give uniform drying, free from cockle.

Hooperwood S/AA Dryer Felts are completely stabilized as to stretch and shrinkage. The original seam, whether sewed, riveted, or glued, will last the life of the felt.

S/AA is a typical example of how Hooperwood Dryer Felt Engineering works to meet your dryer felt needs. Write today for a sample of S/AA.

WM. E. HOOPER & SONS CO.

General Sales Offices:

New York 320 Broadway — PHILADELPHIA Juniper & Cherry Sts. — Chicago 300 W. Adams St.

Hooperwood Mills: Woodberry, Baltimore, Md.

HOOPERWOOD DRYER FELTS

The Paper Industry

Technology • Engineering • Management • Production

VOLUME 32 • NUMBER 3 • JUNE, 1950

Features . . .

Executives Attend Institute Conference 258
New Color Room Completed at Mando's Ft. Frances Mill 261
Hardwood Pulping Discussed at Forest Products Lab. 265
Modernization at Maizewood's Insulating-Board Mill 270
by Richard W. Porter
Pension Plans—Your Problems 274
by William J. Casey
Power Tool Drives Studs and Anchor Bolts 276
Bark Utilization at Mando 278
by Wm. C. Rindsland
How to Plan Paper Mill Maintenance 281
by C. C. Winston and S. C. Hamlin
Paper and Paperboard Making—IV 283
by Harry Williamson
Stainless Steel . . . What Makes It So? 288
New Safety Device Contest 290
Heat Balance for Three Types of Pulp Mills (Part II) 316
by G. Edling
Printer's Paper Troubles 319
by R. H. Simmons

News . . .

Industry News 258-268
Safety News 290
Association News 295
Allied News 298
Names in the News 303
Necrology 308
International Review 311

Departments . . .

Editorial 251-253
Current Comment 255
Paper Sketches 289
Coming Events 296
New Products 324-328
New Literature 330-334
Current Market Quotations 336-337
Index to Advertisers 338-339

THE PAPER INDUSTRY is indexed regularly in **Engineering Index** and **Industrial Arts Index.** An index to each volume is issued annually by the publisher as a part of the April number.

Copyright 1950 by Fritz Publications, Inc.

Published monthly by:
FRITZ PUBLICATIONS, INC.
Edward B. Fritz (1869-1939), Founder

Publication Staff:

President and General Manager
A. SCOTT DOWD

Vice President and Treasurer
A. C. L. FRITZ

Secretary
A. C. BRUCE

Editorial Director
RICHARD W. PORTER

Editor
BESSE MERRITHEW

Production Manager
EDGAR C. FARREN

Circulation Director
G. E. VON ROSEN

Circulation Field Representative
C. J. ELWELL

Advertising Representatives:

CHICAGO 5: **John D. Henderson,** 59 East Van Buren Street, Wabash 2-3543.

NEW YORK 20: **Raymond S. van Nydeck,** 9 Rockefeller Plaza, Circle 7-3085.

BOSTON 16: **Meade & Company,** 471 Statler Building, Liberty 9677.

CLEVELAND: **L. M. Perkins,** 1199 Dorsh Road, South Euclid 21, Ohio, Evergreen 1-3232.

LOS ANGELES 14: **Nourse Associates,** 412 West Sixth Street, Vandike 5875 (Murray Bothwell).

SEATTLE 4: **Nourse Associates,** Empire Building, Eliot 1769, (Arthur G. Neitz).

THE PAPER INDUSTRY—founded in 1919—known as "The Paper Industry and Paper World" from June, 1939, through December, 1949, assumed its original title with the January, 1950, issue.

Published at 404 North Wesley Avenue, Mount Morris, Illinois.

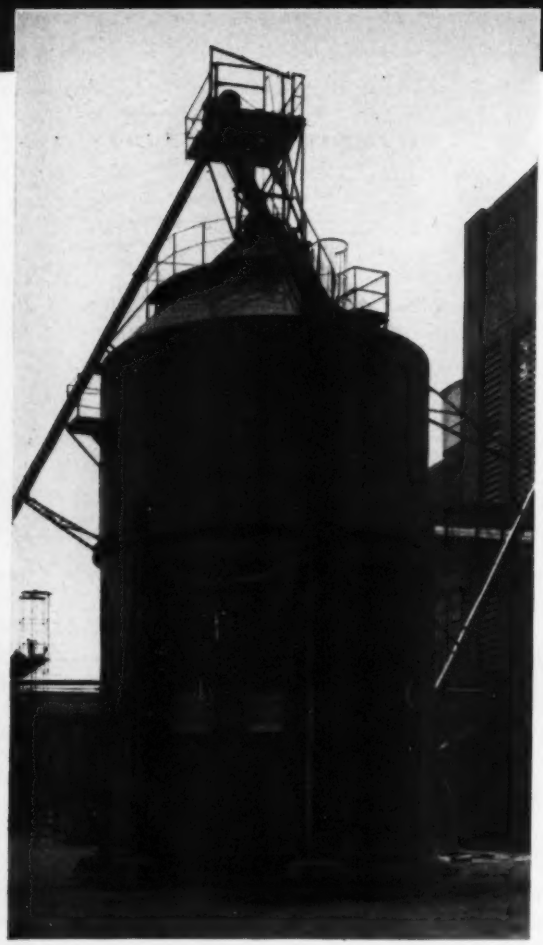
Address all correspondence to Editorial and Executive Office, 59 East Van Buren Street, Chicago 5, Illinois.

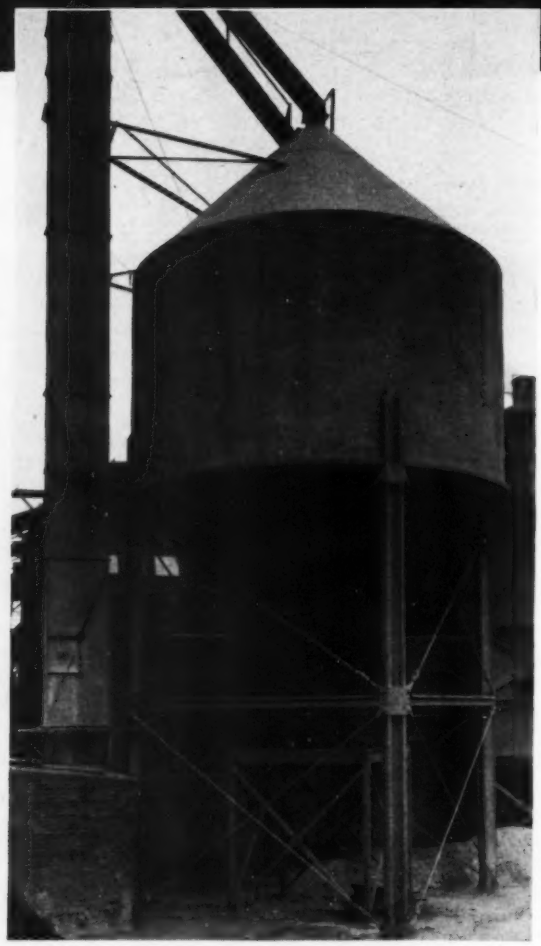
Member: Audit Bureau of Circulation, The Associated Business Publications.

Entered as second class matter December 13, 1948, at the post office at Mount Morris, Illinois, under the Act of March 3, 1879.

Subscription rates: United States, U.S. Possessions, Canada, and Pan-American countries, $2.00 for one year, $3.00 for two years. All other countries, $3.00 for one year, $5.00 for two years.

Georgia mill uses Horton* structures in expanding capacity 100 per cent





The St. Mary's Kraft Corporation recently expanded the pulp producing capacity of its mill at St. Mary's, Georgia, from 250 to 500 tons per day—an increase of 100 per cent. The mill converts slash pine into pulp and manufactures kraft paper for shipping sacks, wrapping and other paper products.

Horton* steel plate structures were used extensively in this expansion program. We furnished eight digesters, several liquor storage tanks, a 15,000-bbl. fuel oil tank, a chip tank, a blow tank, a salt cake tank and a lime storage tank.

An extensive installation like this proves that we know how to build the specialized processing equipment and storage tanks used at paper mills. When you decide to expand or modernize for efficiency, consider the services we offer the paper industry. Our shops do welding, x-raying, and stress-relieving to code requirements. Corrosion-resistant linings can be furnished and our five plants are located to give you prompt service. Write our nearest office for a quotation when you need storage tanks, digesters, or other heavy steel plate work.

Two of the Horton structures installed in connection with the expansion of the St. Mary's Kraft Corporation mill at St. Mary's, Georgia, are shown above. They are (left) 28-ft. diam. by 16-ft. salt cake storage tank and (right) 12-ft. diam. by 10-ft. lime storage tank.*

*** Trade name for products built by the*

CHICAGO BRIDGE & IRON COMPANY

Atlanta, 3.....2143 Healey Building
Birmingham, 1.....1511 North 50th Street
Boston, 10.....1026—201 Devonshire Street
Chicago, 4.....2445 McCormick Building
Cleveland, 15.....2267 Guildhall Building
Detroit, 26.....1566 Lafayette Building
Havana.....402 Abreu Building
Houston, 2.....2143 National Standard Building
Los Angeles, 17.....1559 General Petroleum Building
New York, 6.....3350—165 Broadway Building
Philadelphia, 3.....1653—1700 Walnut Street Building
Salt Lake City, 4.....527 West 17th South Street
San Francisco, 11.....1247—22 Battery Street Building
Seattle, 1.....1327 Henry Building
Tulsa, 3.....1651 Hunt Building

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY, and GREENVILLE, PA. In Canada: HORTON STEEL WORKS, Limited, FORT ERIE, ONT.

for your FREE copy

BECCO DE-INKING
BECCO GLASSINE BLEACHING
BECCO COLD STEEP BLEACHING PROCESS
BECCO LABORATORY PROCEDURES
PULP BLEACHING WITH HYDROGEN PEROXIDE
Becco Sales Corporation
SALES AGENT FOR BUFFALO ELECTRO-CHEMICAL COMPANY, INC. BUFFALO 7, N. Y.
BUFFALO • BOSTON • CHARLOTTE • CHICAGO • NEW YORK • PHILADELPHIA

. . . here for your information are 72 pages of up-to-the-minute data about the practice of pulp bleaching with BECCO Hydrogen Peroxide.

Methods of bleaching . . . typical flow sheets . . . variables . . . testing procedures . . . equipment . . . properties of bleached pulp.

Other literature available on Cold Steep Bleaching (P-2), Peroxide De-inking (P-3), Glassine Bleaching (P-4), Laboratory Bleaching Methods (P-5).

To get your FREE copies, fill in and mail the convenient coupon below.

BECCO SALES CORPORATION, Sales Agent for Buffalo Electro-Chemical Company, Inc., Buffalo 7, N.Y.

Buffalo • Boston • Charlotte
Chicago • New York • Philadelphia

BECCO SALES CORPORATION, Buffalo 7, N. Y.

Please send me a copy of the booklet, "Pulp Bleaching with Hydrogen Peroxide."
Also Booklet P2 ☐ . . . P-3 ☐ . . . P4 ☐ . . . P-5 ☐

Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____

PIO-5b

STARCHES
DEXTRINES
GUMS
CORN SYRUPS

Products offered by Anheuser-Busch to the American paper industry have been produced to meet specific industry requirements. Backed by research and practical "know how", their uniform performance and dependable quality have built an enviable reputation throughout the industry. Write us for further information.

Corn Products Department

ANHEUSER-BUSCH, INC.

SAINT LOUIS

Announcing the NEW

JENKINS SWINGTITE

with an exclusive new design that assures smooth action, positive closure, and longer life

In the new Jenkins SWINGTITE Fast-Action Bronze Gate Valve, the exclusive rolling disc and guide track design lengthens valve life and assures maximum tightness as it prevents uneven wear of seating surfaces. As the valve is opened or closed, guide rims around the seating surfaces of discs roll freely over guide tracks cast in the body, distributing wear evenly, dislodging foreign matter, and providing a polishing action for seating surfaces.

The SWINGTITE can be opened or closed instantaneously and easily with less than a quarter turn of the malleable iron lever which activates the self-adjusting ball and socket type double disc.

Wherever full, free flow is essential . . . where valve opening or closing must be instantaneous . . . you will see more and more Jenkins SWINGTITE Bronze Gate Valves setting new standards of performance and endurance. They are recommended especially for such services as laundry machinery, dish-washing equipment, gasoline and fuel oil lines, fire extinguishing steam lines in kitchens, and dispensing lines to tanks or vats.

Get all the facts on the new Jenkins SWINGTITE. Find out how much smoother-operating, how much *longer-lasting* these fast-action Bronze Gate Valves can be when *Jenkins* builds them. Send for the new folder, Form No. 196, containing full details. Jenkins Bros., 100 Park Avenue, New York 17, N.Y. Jenkins Bros., Ltd., Montreal.

Sold through leading Industrial Distributors

NO OTHER VALVE of its type HAS THIS FEATURE

Notice the guide rims (A) of the discs which rotate freely on the guide tracks (B) cast in the body, as the valve opens or closes. This roller action provides a self-cleaning and polishing effect, and also distributes the wear, since the seating position of the discs changes with each closing. Rapid, uneven wear is prevented, and continuous tight closure assured.

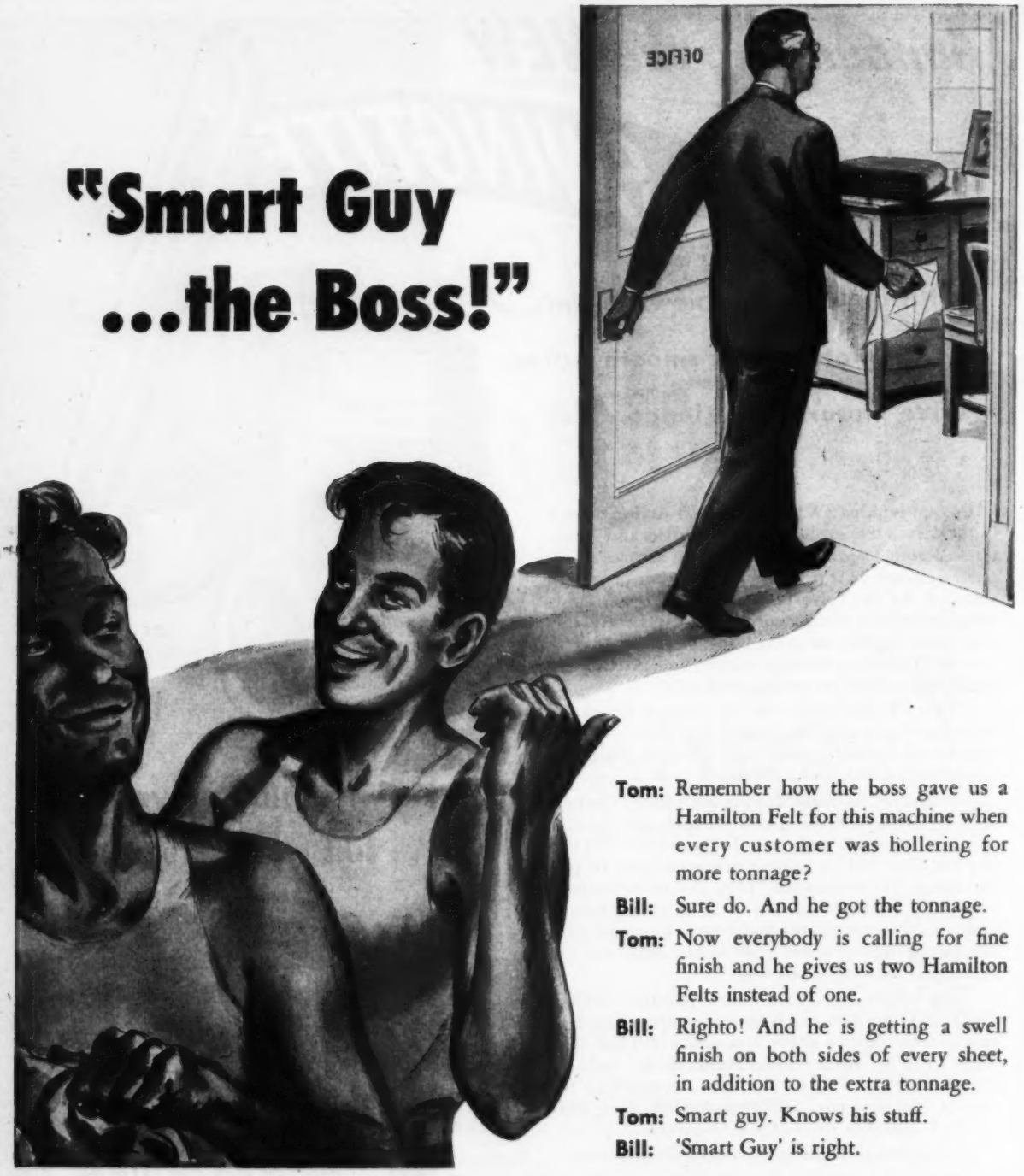
JENKINS VALVES

LOOK FOR THE DIAMOND MARK

TRADE JENKINS MARK

Jenkins Bros

"Smart Guy ...the Boss!"



Tom: Remember how the boss gave us a Hamilton Felt for this machine when every customer was hollering for more tonnage?

Bill: Sure do. And he got the tonnage.

Tom: Now everybody is calling for fine finish and he gives us two Hamilton Felts instead of one.

Bill: Righto! And he is getting a swell finish on both sides of every sheet, in addition to the extra tonnage.

Tom: Smart guy. Knows his stuff.

Bill: 'Smart Guy' is right.

SHULER & BENNINGHOFEN, HAMILTON, OHIO

• Miami Woolen Mills •

Hamilton Felts

• Established 1858 •

Timber *is a crop...*

Timber supplies need never be exhausted, because "Timber is a Crop"... and because far-sighted forest management is harvesting timber more judiciously and stretching it farther through improved wood utilization.

The Weyerhaeuser policy of forest management, protecting the productivity of its forest tracts, is based on the determination to maintain a continuous supply of forest materials for the future. Under this "sustained yield" program each tree farm is preserved by first harvesting the timber crop and then insuring a new crop by the hand planting of seedlings and by leaving blocks of mature trees as a source for natural reseeding.

The Pulp Division, Weyerhaeuser Timber Company, ever striving for greater efficiency in wood utilization, has nearly doubled the pulp production from a given forest acreage. New mill developments such as hydraulic barking, whole log chipping and slab barking make possible more complete utilization of the forest crop ... insuring an adequate supply of wood now and in the future.

PULP DIVISION

WEYERHAEUSER

FIBREpulper

BY DOWNINGTOWN

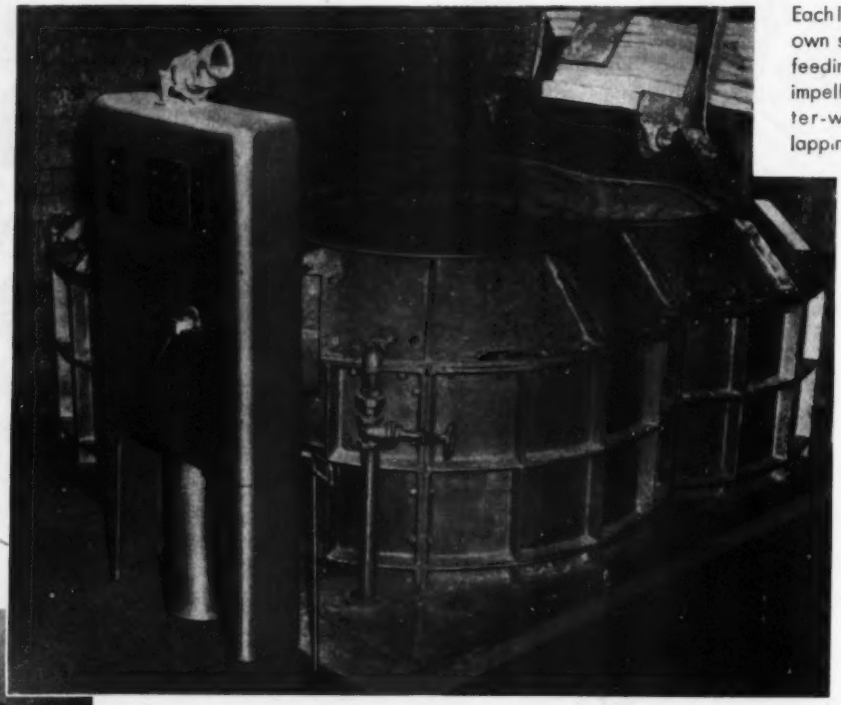
marks major pulping advance

IT'S THE SHAPE

FIBREpulper designed and custom-built for your operating conditions

Here's why

Each lobe develops its own stream of stock, feeding back to the impeller, with an inter-weaving, overlapping pattern.



Operating-floor view of FIBREpulper and auxiliary equipment in large eastern tissue mill.

Internal view of tub, showing rotor and extraction plates.

FIBREpulper being charged with baled pulp from conveyor.

Advantages:

Less horsepower per ton

Shorter pulping period—less hydration—higher freeness

Shorter pulping period also means smaller unit for given tonnage

Easier to "floor plan"

More pulping for your money

PATENTS APPLIED FOR

DOWNINGTOWN MANUFACTURING COMPANY

DOWNINGTOWN, PA.

Pacific Coast Representative: JOHN V. ROSLUND, Pacific Bldg., Portland 4, Ore.

DESIGNERS AND BUILDERS OF PAPER MAKING MACHINERY SINCE 1880

At **MANDO**

American *DiesELectric** Locomotive Cranes

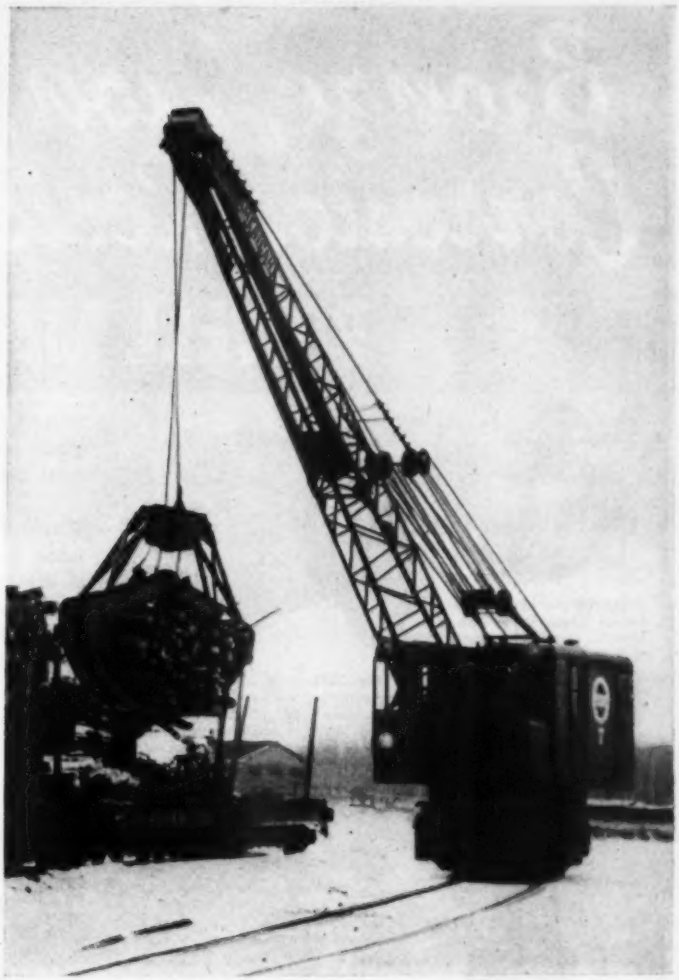
"Do twice the work at half the cost!"

They think in big figures, at Minnesota and Ontario Paper Company. When they proved to themselves that American 40-Ton DiesELectric Locomotive Cranes cut fuel costs in half, and doubled work output per crane, they saw *big savings* involved.

As a result, Mando is now replacing all steam cranes with swift, efficient American DiesELectrics . . . one for two. Each of the new machines handles about 30 carloads of wood on an 8-hour shift. One man runs each crane. There is no time out for steaming up, or for coal or water stops.

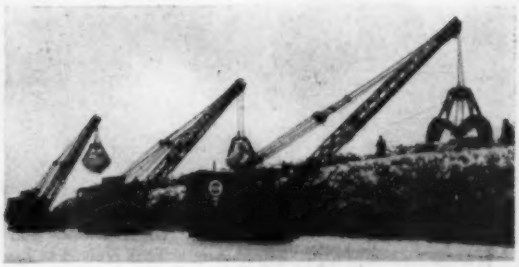
Do these figures make yours look out of date? Mail the coupon below, for facts on *modern* material handling.

*Diesel-Electric Locomotive Crane Patent No. 2083460. Touch Control Patent No. 2370856.



FAST AND VERSATILE, these cranes handle car switching and many other jobs. This one is installing a 30-ton turbo-generator.

280,000 CORDS of pulpwood in the world's largest pulpwood storage facility. Mile-long yard contains 42 storage ranks, 20 feet high, served by both truck and rail cars.



THREE DO THE WORK OF SIX! The American 40-Ton DiesELectric shown here are doing work of six steam cranes. Each "bite" moves about three tons of wood. The 50 and 55 foot booms make a simple task of piling the pulpwood to a height of 20 feet.

American Hoist & DERRICK COMPANY

St. Paul 1, Minnesota

Plant No. 2: SO. KEARNY, N.J.

Sales Offices: NEW YORK • PITTSBURGH • CHICAGO

American Hoist & Derrick Co. • St. Paul 1, Minn. 3602

Please send data on American DiesELectric Locomotive Cranes_____tons capacity.

Name_____

Company_____

Address_____

City_____ Zone___ State_____

42

Bronze, Iron, Steel and Corrosion-Resisting Valves-

POWELL MAKES THEM ALL!

Fig. 1708 — 200-pound Bronze Globe Valve with screwed ends, union bonnet, renewable, specially heat treated stainless steel seat and regrindable, renewable "Powellium" nickel-bronze disc.

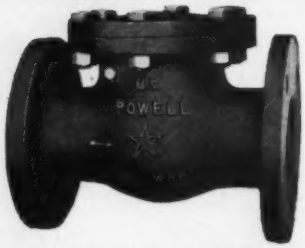


Fig. 2433 — 150 - pound Bronze Regrinding Swing Check Valve. Flanged ends and bolted flanged cap. Disc has ample lift to permit full, straightway, unobstructed flow through the valve body.

When you come to ONE SOURCE, you simplify your valve buying—and stocking of spare valves and parts—for your entire flow control system.

Powell Bronze, Iron, and Steel Valves are second to none in giving long, trouble-free service. And when it comes to Special Design and Alloy Valves for Corrosion Resistance, Powell is the acknowledged leader. In fact, Powell makes the *only* COMPLETE line of these valves available to Industry today.

Fig. 1793 — Large 125-pound Iron Body Bronze Mounted Gate Valve. Flanged ends, bolted flanged yoke, outside screw rising stem and tapered solid wedge. Also available in All Iron.

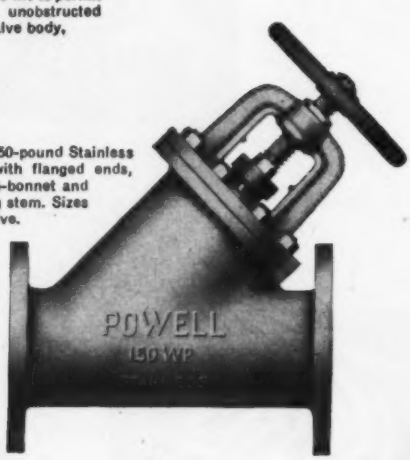


Fig. 1944—Large 150-pound Stainless Steel "Y" Valve with flanged ends, bolted flanged yoke-bonnet and outside screw rising stem. Sizes 2½" to 12", inclusive.

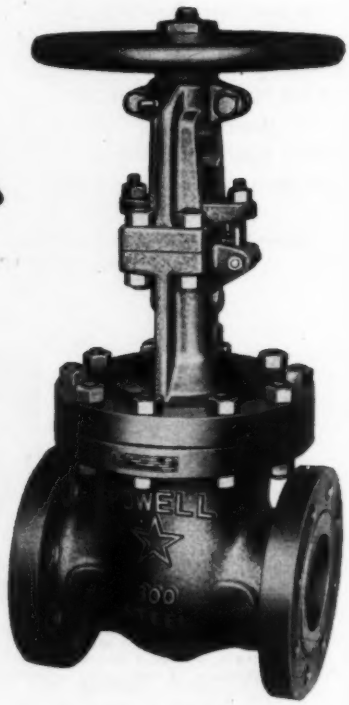


Fig. 3003—Class 300-pound Cast Steel Gate Valve with flanged ends, outside screw rising stem, bolted flanged yoke and tapered solid wedge.

The Complete Powell Line includes Globe, Angle, "Y", Gate, Check, Non-return, Relief and Flush Bottom Tank Valves in Bronze, Iron, Steel and a wide range of Corrosion-resistant metals and alloys.

Ask your nearest Distributor—or write direct

The Wm. Powell Co., Cincinnati 22, Ohio

DISTRIBUTORS AND STOCKS IN ALL PRINCIPAL CITIES

POWELL VALVES

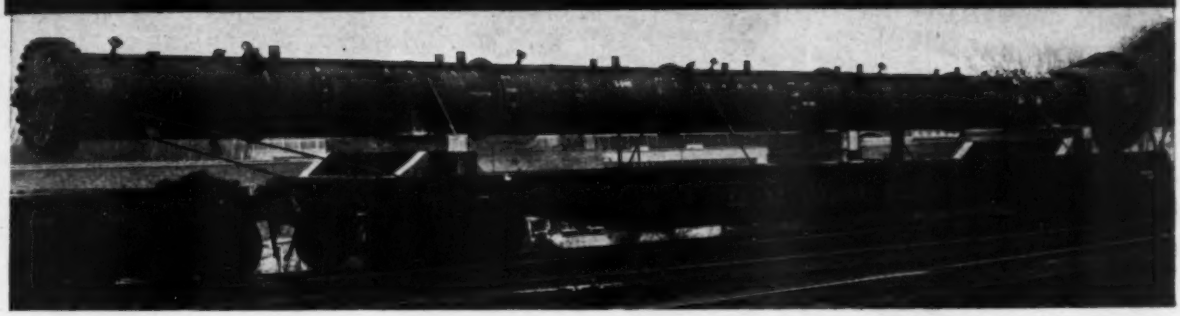
VESSEL DIVISION

NEWS

A.O. Smith 76th Anniversary 1876 - 1950

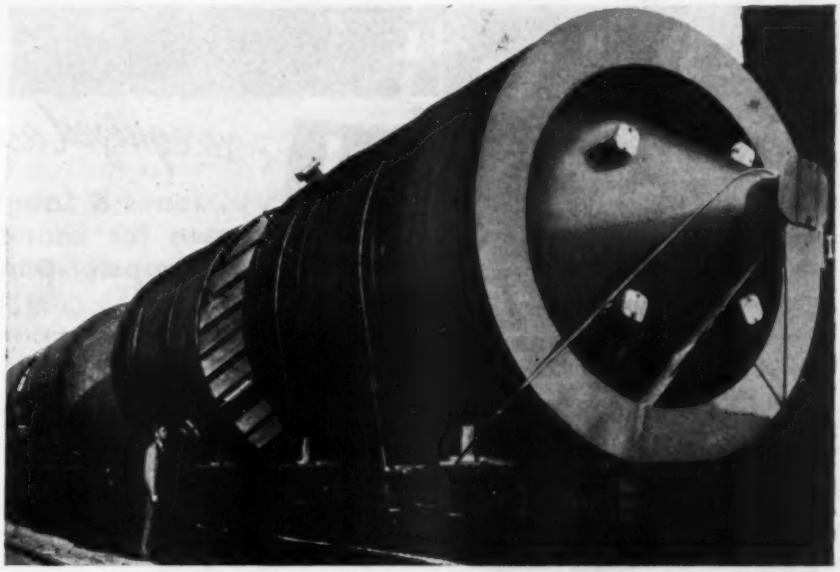
A.O. Smith
CORPORATION

Atlanta 3 • Boston 16 • Chicago 4 • Dallas 1 • Houston 2
Los Angeles 14 • New York 17 • Philadelphia 3 • Pittsburgh 19
Salt Lake City 1 • Seattle 1 • Tulsa 3 • Washington 6, D.C.
International Division: Milwaukee 1

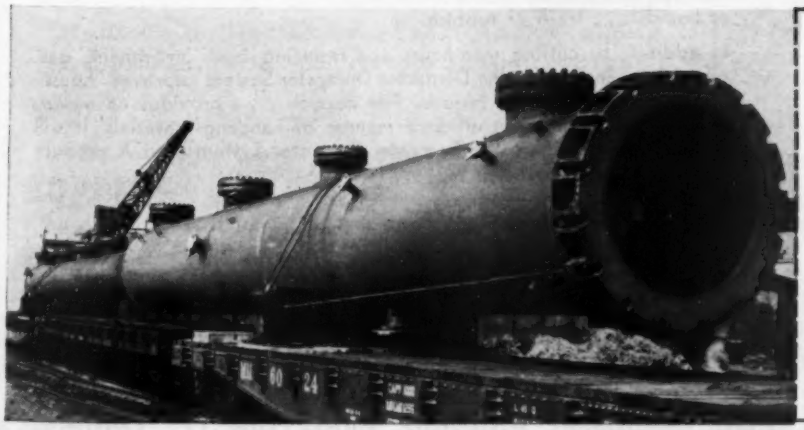


INTO EVERY SMITHlined FAT-SPLITTING TOWER, like the above 68-ft.-long SMITHway Tower, goes the experience and knowledge gained from a long and extensive program of research and development into the corrosion problems of the Fatty Acid Industry.

THREADING A NEEDLE. Getting a 12 ft. dia. by 43 ft. long paper mill replacement digester into an existing building is a difficult feat. A. O. Smith did it by shipping the SMITHlined Digesters *in sections* for final assembly and welding in place inside the paper mill.



A. O. SMITH MAKES ALL TYPES OF OIL-REFINING PRESSURE VESSELS. Here is one type, a SMITHlined Absorber Tower three railroad cars long (approximately 107 ft. long), leaving for a refinery in Ohio.



A. O. Smith Corporation, Dept. PI-650
Milwaukee 1, Wisconsin

Without obligation, send us the latest A. O. Smith Vessel Bulletins:

- ☐ V-44: Field Assembly of Pressure Vessels
- ☐ V-46: Alloy, Alloy-lined, Clad, and Glass-lined Vessels
- ☐ V-52: Multi-Layer Vessel Manufacture and Assembly

Name_____

Firm_____

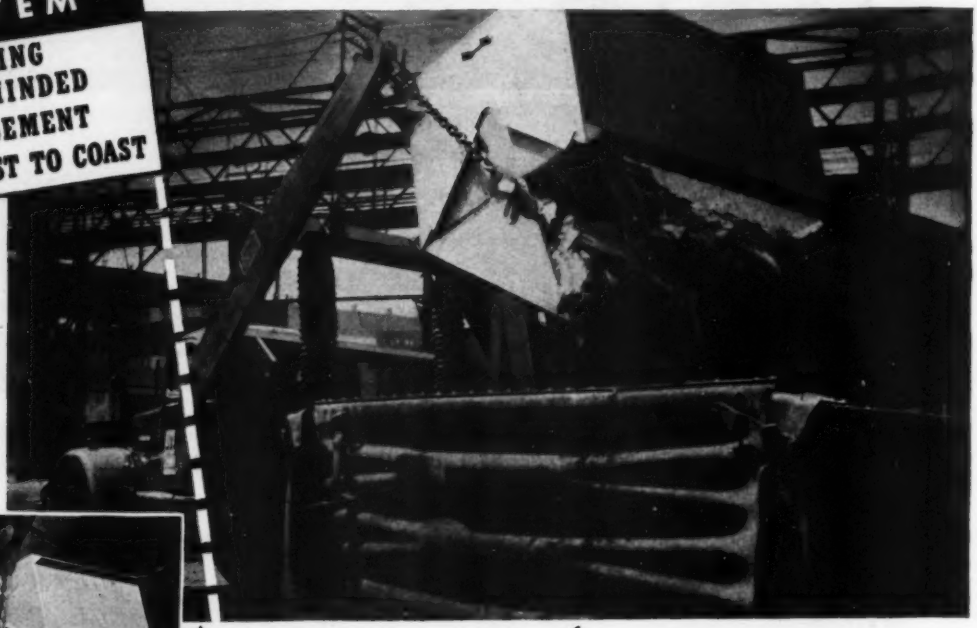
Street_____

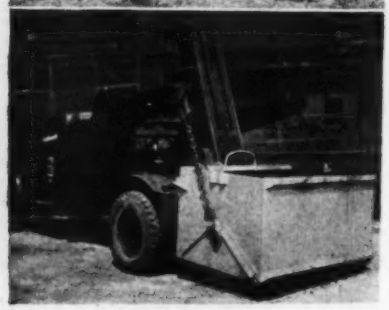
City_____ State_____

DEMPSTER DUMPSTER SYSTEM

SERVING COST-MINDED MANAGEMENT FROM COAST TO COAST

. . . handling bulk materials of every description at phenomenal savings





Photos show the three simple stages of servicing a container. The Dempster-Dumpster, operated from hydraulic controls by driver in the cab, picks up each container and hauls it to point of disposition where it may be dumped or set down intact.

J&L STEEL — recognized across the nation

. . . Jones & Laughlin Steel Corp., well known for sound management, uses the Dempster-Dumpster System

J & L Steel is among the hundreds of well managed manufacturers, both large and small, who use the Dempster-Dumpster System of bulk materials handling . . . the system recognized across the nation for its efficiency and ability to reduce costs.

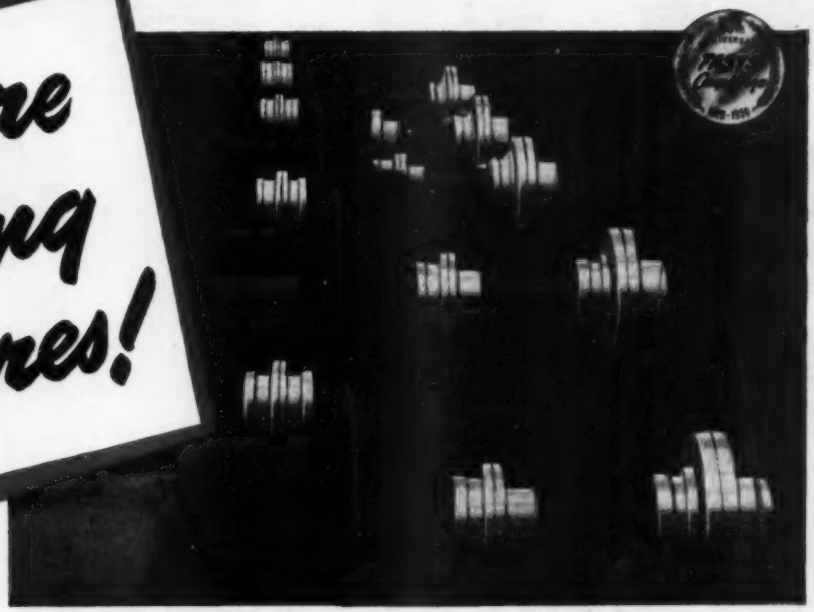
There is never an idle moment for a truck mounted Dempster-Dumpster around a manufacturing plant. With a variety of Dempster-Dumpster containers spotted inside and outside your plant, one truck mounted Dempster-Dumpster, with only one man, the driver is kept busy servicing one pre-loaded container after another. These detachable containers, ranging in size up to 12 cu. yds., carry pay-loads equal to conventional truck bodies. They are built in a wide variety of designs best suited to the type of materials handled—be they bulky, light or heavy . . . solids or liquids . . . trash or rubbish.

In addition to cutting man-hours and reducing truck investment, gas, oil, maintenance costs, the Dempster-Dumpster System improves "housekeeping" methods . . . reduces fire hazards . . . provides an easier, quicker, safer and more efficient manner of handling materials. It will pay you to investigate the Dempster-Dumpster System now! A product of Dempster Brothers, Inc.

One Dempster-Dumpster Services All Containers. . . All Designs. . . All Sizes

DEMPSTER BROTHERS, 760 Dempster Building, Knoxville 17, Tennessee

No More Coupling Failures!



How KOPPERS ENGINEERING Eliminates *Shutdowns for Coupling Replacement* in your plant

Stop coupling failures *before they start*—specify Fast's—the original gear-type coupling. Fast's couplings provide flexibility *without perishable parts,* have been industry's standard for *long-life, low-cost* operation for 30 years!

No matter what type coupling you need, whether it's a floating shaft model, standard or other type, when you buy Fast's Couplings you get the *added advantage* of Koppers Engineering Service. Koppers engineers, backed by *30 years* of Fast's Coupling experience, study your problem, then show you *which* Fast's Coupling you need (and more important) *why you need it!*

Take advantage of Koppers' long-term coupling experience. Specify Fast's and get Koppers Engineering Service —a valuable service you *cannot buy,* but which Koppers offers *without obligation.* The Fast's Catalog contains full details, shows types available and gives complete coupling data. Mail coupon for your free copy today!

These FAST'S COUPLING *Services save you money!*

UNSURPASSED ENGINEERING . . . *Koppers' engineers are acknowledged the best in the industry. Their practical knowledge, backed with 30 years' coupling experience, is at your service!*

IMMEDIATE DELIVERY . . . *All standard types and sizes are available for immediate delivery from "on hand" stocks. In case of emergency, just wire factory for special rush delivery!*

LOWEST COST PER YEAR . . . *Fast's Couplings will outlast equipment they connect if properly maintained. Their cost may be spread out over 25 years or more, offering you lowest coupling cost per year!*

KOPPERS

FAST'S
THE ORIGINAL GEAR-TYPE
Couplings

Mail

FOR FREE CATALOG

KOPPERS CO., INC., *Fast's Coupling Dept.,*
276 Scott St., Baltimore 3, Maryland.

Please send me a copy of Fast's Catalog.

Name.....

Company.....

Address.....

City.....Zone.....State.....

Now Available

The New Edition of the Sandy Hill BROCHURE

OF MODERN PULP & PAPER MACHINERY

Bigger, More Complete than the widely acclaimed FIRST EDITION!

Dedicated to the pulp and paper industry as a whole, this new brochure is even more complete than previous editions.

It's a clear and comprehensive outline of the many types of machinery used in the processes leading from raw material to the finished product. If you are a key man in a pulp and paper mill, send for your copy without delay . . . and let us know your particular problem.

Our engineers are anxious to give you every possible assistance.

Sandy Hill Iron & Brass Works

Hudson Falls, N. Y.

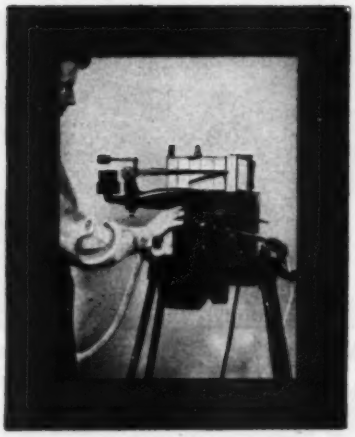
Machinists and Founders Specializing in Paper and Pulp Mill Machinery

Some Leading Items:
Fourdrinier Paper Machines
Yankee Fourdrinier Machines
Cylinder Paper Machines
Feltless Wet Machines

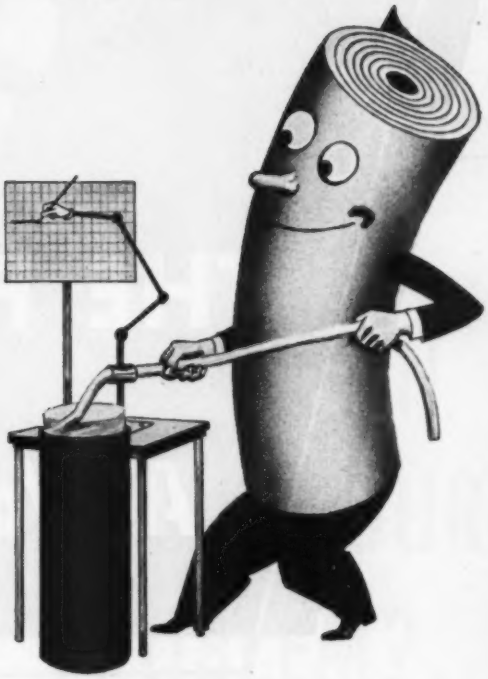
Bertrams Flow Distributor
Kamyr Bleaching Equipment
Stock Pumps
Pulp Grinders
"Selective" and Corner Drives

Dandy Roll Drives
Quick Opening Gate Valves
Scofield Felt Conditioners
Cleveland Type Bearings
Castings—Iron, Bronze, Aluminum

"Packer" Screens
Shaker Screens
Neilson Slice
Nilsa Bag Machines
Nilsaton Printing Presses



CHECKING EVENNESS OF ROVING WITH LINEAR REGULARITY TESTER. One of a series of laboratory controls throughout production to assure fabric uniformity in all Mt. Vernon-Woodberry products.



SCIENTIFIC CONSTRUCTION

Makes the Big Difference

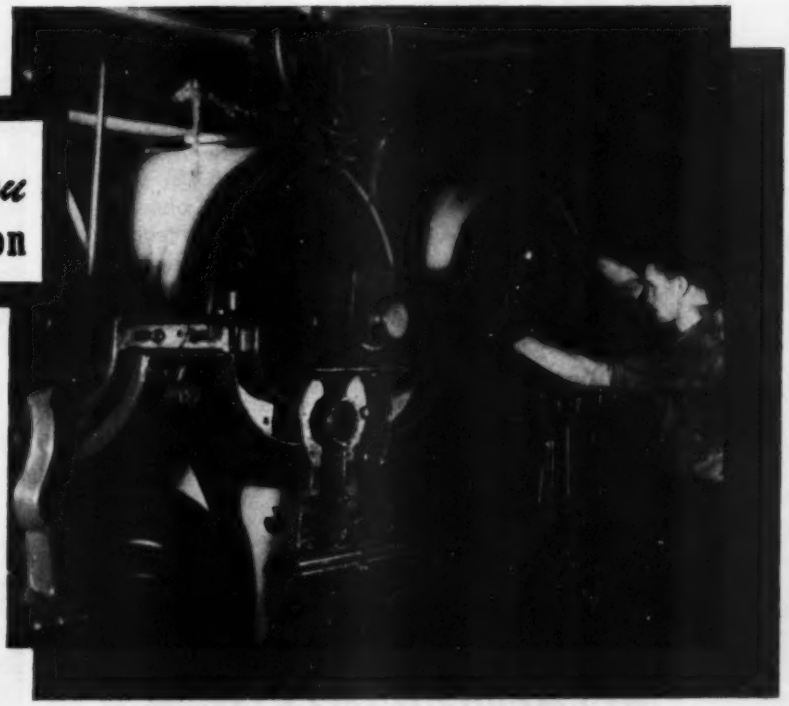
In DRYER FELTS

PATENTED

WOODBERRY 887 REINFORCED DRYER FELT

Gives You

Scientific Construction



Asbestos yarns woven at scientifically determined intervals into the face of Woodberry 887 heavy duty dryer felts means longer wear, lower steam consumption, increased porosity, finer paper quality.

AT YOUR SERVICE

Mt. Vernon-Woodberry's staff of textile engineers is available on request to help you with your problems in development or application of industrial fabrics.

Mt. Vernon-Woodberry Mills

Branch Offices: Chicago • Atlanta • Baltimore • Boston • Los Angeles • Akron

TURNER HALSEY COMPANY
Selling Agents
40 WORTH ST NEW YORK

THE FIRST STEP *is* *All You Need Take*

WHEN YOU TURN THE COMPLETE POWER PIPING JOB OVER TO P. P. & E.

Just take one step when you need new power piping. Turn the complete job over to P.P.&E. By placing this responsibility in our hands you obtain the advantages of a distinctive engineering technique, complete shop fabrication facilities, specialized metallurgical control methods complete with model testing, and skill in meeting and solving present-day field erection problems. Furthermore, you are relieved of detail . . . and utilize to the utmost the knowledge we have accumulated through almost a half century of practical experience in this field. Ask our nearest representative for further information.

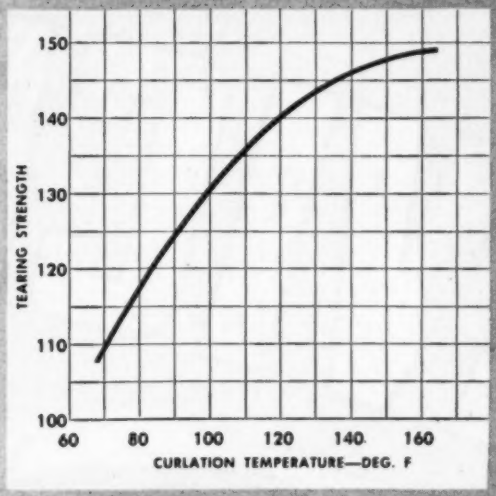
Pittsburgh Piping

AND EQUIPMENT COMPANY

10 Forty-Third Street—Pittsburgh, Penna.

Woolworth Building, New York
Whitehead Building, Atlanta
Book Tower, Detroit
525 Market Street, San Francisco
Peoples Gas Building, Chicago
Public Square Building, Cleveland
10 High Street, Boston
Heights State Bank Bldg., Houston

TEAR CURVE



Effect of Temperature During Curlation Using Power Consumption of 2.5 H.P. Days Per A.D. Ton on the Properties of

PREVIOUSLY UNDRIED NORTHERN UNBLEACHED SULPHITE PULP

TEST DATA

TEMPERATURE OF CURLATION °F	RAW*	70	120	160
FREENESS	835	835	845	856
MULLEN	70.8	62.1	52.6	37.8
TEAR	95	109	140	149
DENSOMETER	14.0	3.7	1.2	0.7

*WITHOUT CURLATION

NOTE: Description of the testing procedures employed by The Curlator Corporation laboratory will be provided upon request.

The CURLATOR† is a tool for altering the properties of pulp and paper to obtain qualities hitherto unachievable by mechanical means. The effects of CURLATION are controllable over a wide range by conditions of treatment. They vary with the raw material and may be described only in relation to a particular pulp.

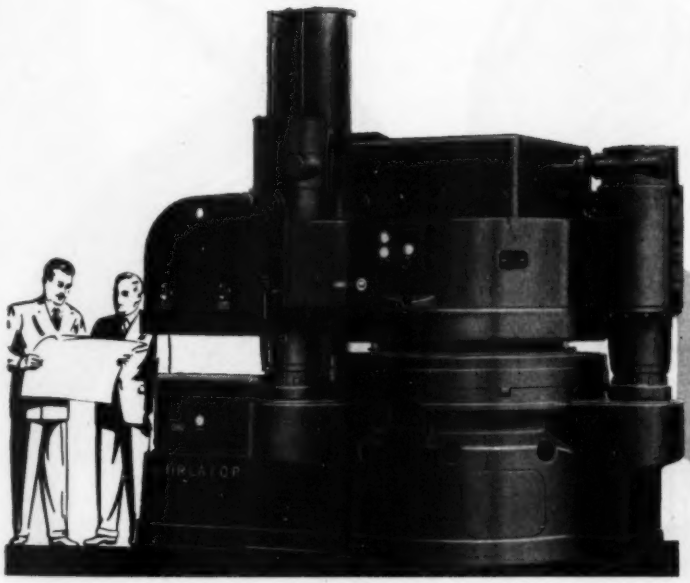
MAY CURLATION SOLVE YOUR PROBLEM?

CURLATION is a fully tested and thoroughly proved mechanical process. It not only produces a permanent change in the shape of pulp fibres, but also exerts a powerful de-shiving action, with negligible change in freeness.

The effects obtainable with CURLATION vary widely with the raw material and the conditions of treatment. In general, CURLATION tends to produce an easier beating pulp from which water is more easily removed.

Sheets of CURLATED pulp exhibit a more even textured matte appearance. In addition, the range of qualities obtainable from a given pulp is broadened.

Other important advantages exist. Your inquiries are invited.



CURLATOR† Corporation

565 BLOSSOM ROAD · ROCHESTER 10, NEW YORK

†T. M. Reg.—Curlator Corporation, Rochester, N. Y.

for SERVICE

Appleton FELTS

T. M. REG.
U.S. PAT. OFF.

APPLETON WOOLEN MILLS
APPLETON · WISCONSIN

Nalco

PITCH CONTROL Produces These Typical Results:

✓ "PAPER MACHINES IN FINE CONDITION"

From a Nalco Engineer's report on The Nalco System of Pitch Control in a mill producing fine papers:

"Beater Room Superintendent reported that paper machines were in very fine condition when examined during shutdown period over the weekend. Trays were reported in very good condition and much better than formerly noted. No sticking on press rolls. Oliver filter reported in good condition, no plugging. The Savalla Saveall reported in very good condition."

✓ NALCO ELIMINATED PITCH AND POPLAR WAX

In a mill manufacturing semi-chemical pulp, another Nalco Engineer reports:

"This company ran into considerable trouble recently from pitch and poplar wax in their semi-chemical corrugated medium. These waxes caused filling of wires and sticking of press rolls which in turn caused up to 30 breaks in a day. Nalco Pitch Control was applied at the fan pump and eliminated their trouble."

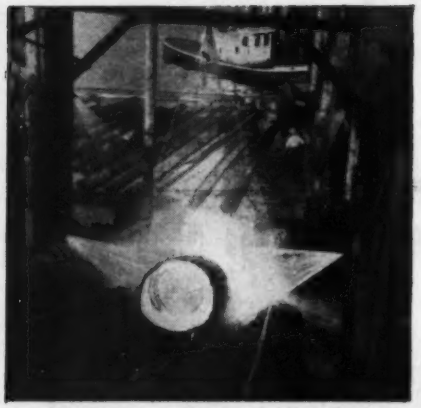
THE examples above are typical of the success and versatility of The Nalco System of Pitch Control in paper and pulp mills. Pitch-free operation saves time and money in these mills, and helps to produce a better product.

If you have pitch control problems, write Nalco for full data on the efficient, economical Nalco System as it may apply to your mill.

NATIONAL ALUMINATE CORPORATION
6232 W. 66th Place • Chicago 38, Illinois
Canadian inquiries should be addressed to Alchem, Limited, Burlington, Ontario, Canada

THE SYSTEM • Serving the Paper Industry through Practical Applied Science

Life Line FOR ANY MILL



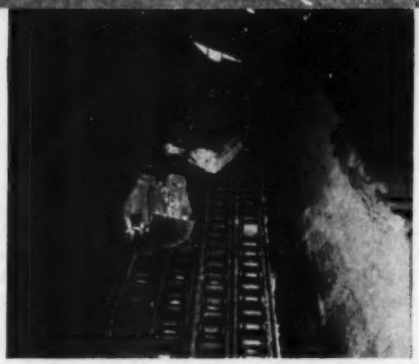
On the log haul, Rex Log Haul and Conveyor Chains keep a steady flow of logs into the mill.

. . . REX PULP MILL CHAINS

The wood handling system is truly the "life line" of the mill. That's why so many mills have standardized on the Rex Line of Standard Pulp Mill Chains. No worries about premature chain failures to break the "life line" . . . hold up production . . . step up costs, with these husky chains on the job. They're built and designed to add life to any wood handling system . . . to keep going under loads and service conditions where ordinary chains would quickly fail.

Whether they're steel or malleable, all Rex Chains are precision-built of the finest materials . . . assembled by the most modern manufacturing methods. Modern assembly line production methods assure product quality and uniformity . . . permit closer inspection and testing.

Right through your mill, you'll benefit by standardizing on the "life line" . . . Rex Pulp Mill Chains. For all the facts, send for your copy of Bulletin 48-27. Call your local Rex Field Office or write Chain Belt Company, 1714 West Bruce Street, Milwaukee 4, Wis.



From splitter to barking drum, Rex Combination Chain, a big favorite in pulp mills, furnishes the moving power.

In a West Coast mill, Rex H-Type Chain carries logs to the debarker. Logs are stored on the chain to eliminate rehandling.

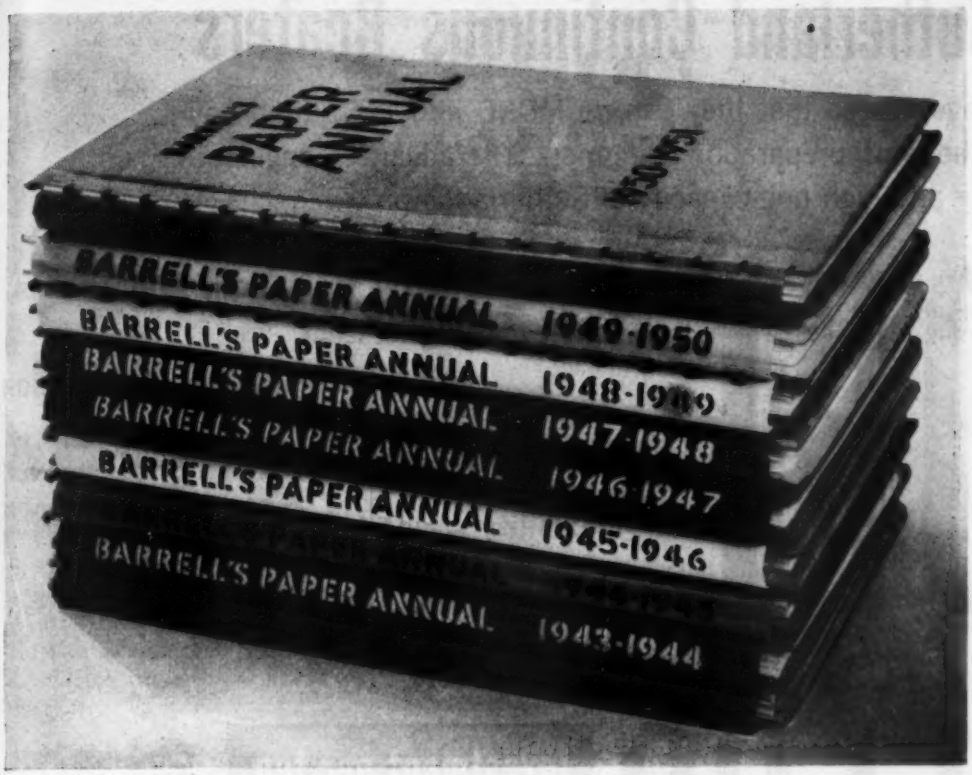
Rex Drop Forged Chain equipped with wooden flights carries hogged fuel for the boilers. Discharge is through the return run of the conveyor. Note the adjustable chutes.

CHAIN BELT REX COMPANY

DRIVE AND CONVEYOR CHAINS

FIRST For LASTING Service

Now available from stock


BARRELL'S PAPER ANNUAL 1949-1950
BARRELL'S PAPER ANNUAL 1948-1949
BARRELL'S PAPER ANNUAL 1947-1948
BARRELL'S PAPER ANNUAL 1946-1947
BARRELL'S PAPER ANNUAL 1945-1946
BARRELL'S PAPER ANNUAL 1943-1944

VOLUME IX

1950 — 1951

Presented as a service to members of the Paper Industry by the makers of Siamese & Tour Boss Dryer Felts

CONTENTS

Directory of Officials of 34 Paper Associations
Progress in Papermaking
Great American Research Laboratories — No. 3
Paper Engineering at Lowell Textile Institute

MAIL NOW TO GET FREE COPY VOL. IX

WILLIAM L. BARRELL COMPANY
52 CHAUNCY ST., BOSTON, MASS.

Please send free copy BARRELL'S PAPER ANNUAL Volume IX.

NAME_____
POSITION_____
FIRM_____
STREET_____
CITY OR TOWN_____ STATE_____

Sutherland Continuous Beaters

have proved that they can do MORE with LESS than any other stuff-preparation equipment. The advanced engineering and high unit-capacity of Sutherlands provide . . .

MORE

QUALITY—better formation, smoothness, finish and higher test
—without fiber destruction

Production Speed —faster drainage

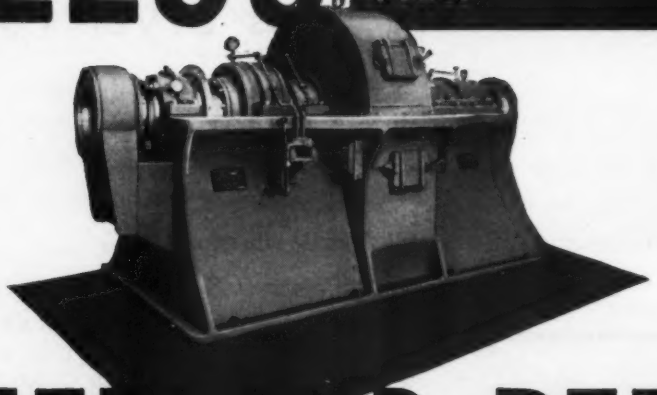
Flexibility —wide beating range

Profit

with

LESS

Investment per ton
Maintenance
Space
Power



Ask us for our catalog.

SUTHERLAND REFINER *Corporation*

TRENTON, NEW JERSEY

Manufactured in the United States by Valley Iron Works Co., Appleton, Wisconsin
Sutherland Refiner Ltd., Windsor Hotel, Montreal, P. Q.

The Paper Industry

June 1950

NSC and The Paper Industry Launch Another Safety Contest

TWENTY-FIVE YEARS AGO E. B. Fritz, founder and publisher of THE PAPER INDUSTRY, awarded the first trophy for outstanding achievement in safety to a winner of the National Safety Council's Paper Industry Safety Contest. This award, now known as the Edward Benton Fritz Memorial Trophy, is still presented annually and is considered the Grand Prize of the Safety Contest.

Because of our continued interest and active participation in the cause of safety we are again cooperating with the Pulp and Paper Section of the National Safety Council in promoting another kind of contest—one that singles out the specific accomplishment of developing mechanical safeguards or devices that help prevent accidents. The purpose of such a contest is threefold: (1) to recognize achievement; (2) to focus attention on these specific developments and make them known to all members of our industry; and (3) to promote greater interest in accident prevention. Entrants need not be members of the National Safety Council.

These objectives seem worthy of consideration and the success of this contest will be measured largely by the extent to which members of the industry participate. THE PAPER INDUSTRY joins the Pulp and Paper Section of the National Safety Council in urging all manufacturers of pulp and paper to support this effort.

Details of the contest are given in the Safety News department of this magazine.

Paper Industry Operates at Capacity

THERE IS ONE INDUSTRY in the United States that faces complete capacity operations during 1950. That industry is *the paper industry*. It might produce more than its rated capacity of 24,617,000 tons.

For example, one kraft board mill in the South, with a rated capacity of 450 tons daily, produced 800 tons one day in April. This was made possible because of full machine trims, perfect stock furnish weights, and operating conditions. Other modern mills could exceed their rated capacities also, under similar conditions. But by and large, throughout the years, the mills of the Industry never have approximated their potential closer than 97 per cent, and that only in 1947 when their rated capacities totaled 21,775,000 tons and they produced 21,030,000 tons.

For this year, the immediate trend indicates a possible 24,000,000 tons of production which would be 97.5 per cent of rated industry capacity, indicating that production is hugging capacity a bit too close for comfort.

The trend, however, is definitely and continuously upward as shown by the total production for the first three months of this year of 5,682,937 tons, an average of 1,894,313 tons per month.

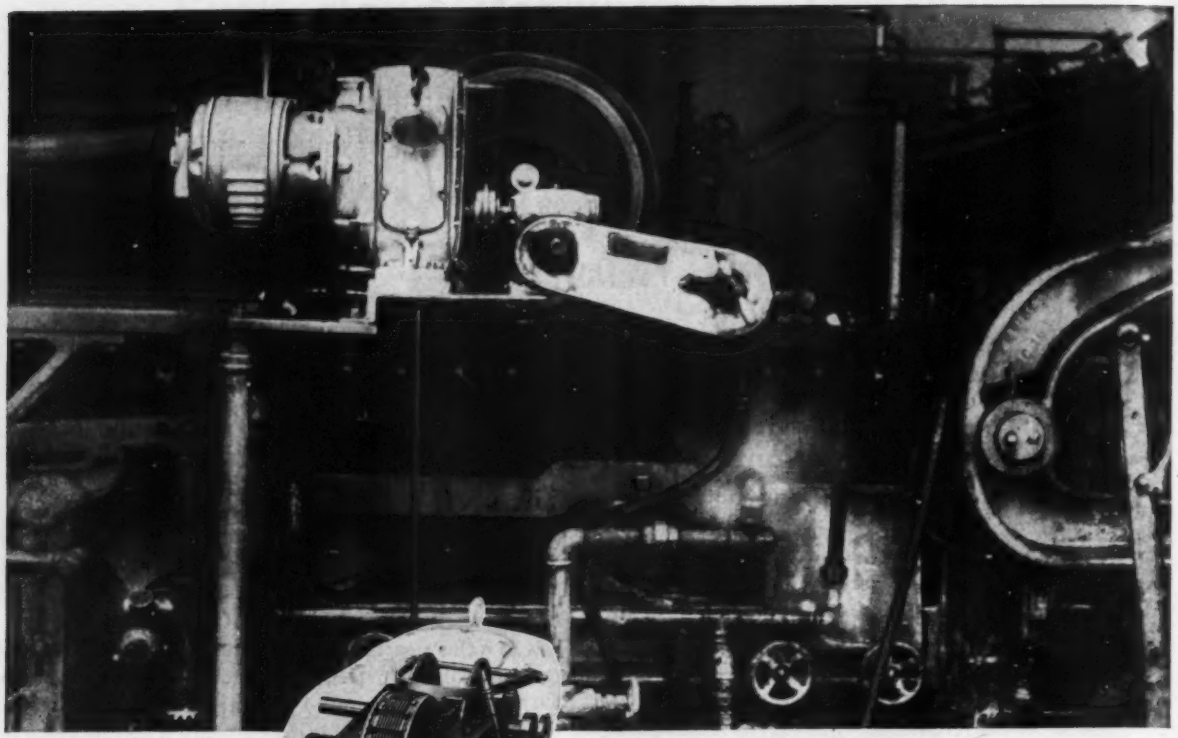
This trend, if maintained throughout the balance of the year, would total 22,731,751 tons or more than 700,000 tons greater than the total production for 1948 of 22,030,000 tons—the highest in history.

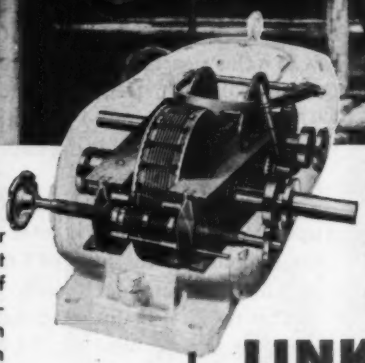
The Industry is making new high records. According to the Bureau of the Census report in March, it topped another all-time record by producing 2,028,019 tons that month. The first time in history to hit and pass the two million ton per month mark. In addition, they report that "Domestic production of newsprint at 85,979 tons in that month is the highest for any postwar month, reflecting increase of new mill (newsprint mill) capacity, as well as the increase in the general level of activity."

The preliminary reports of paper production for the month of April all show continuous, progressive increases:

Week Ending	Per cent of Capacity
April 8	100.3
April 15	101.1
April 22	102.4
April 29	101.5
May 6	103.9

Next came the Department of Commerce Report on general business activity for April which says: "New





Motorized P.I.V. Variable Speed Drive on this Fourdrinier paper machine permits exact synchronization of dandy rolls with Fourdrinier wire, though rolls may vary as much as 4 inches in diameter.

Better Sheet Formation, Sharper Watermarks .. with LINK-BELT P.I.V. DRIVE

By keeping the dandy roll exactly in time with the wire on this Fourdrinier machine, a better sheet formation and sharper watermarks resulted. The problem of dandy rolls varying as much as four inches in diameter, was solved by equipping the machine with a Link-Belt P.I.V. Variable Speed Drive. Dandy rolls of different diameters are brought into synchronism with the wire by simply turning the small hand wheel on the P.I.V. drive and synchronism is maintained by the positive chain drive that provides reliable operation without slip.

This is one of the numerous cases in paper mills where exact speed of a machine affects some feature of the product. Doubtless there are possible applications in your plant. Write for Book 2274 to learn how P.I.V. Variable Speed Drives can help you.

POSITIVE

Power is transmitted from one pair of grooved wheels to another, through a unique chain which forms its own teeth, without slip.

INFINITELY VARIABLE

Speed ratio changes are stepless. Adjustment by easily operated hand wheel permits the most minute variation between input and output speeds, within range of the drive.

LINK-BELT COMPANY

Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8. Offices in Principal Cities. 11,545

Wherever exact synchronization of rotating parts must be maintained in continuous duty operation . . . INDUSTRY USES

LINK-BELT

P.I.V. Variable Speed Drive

orders placed with manufacturers during March hit a postwar record of $20,600 million. This volume was 14 per cent above the previous year level.

And to top the reports for record-breaking this year, the Bureau of the Census took a preliminary squint at the 1950 population census of the United States and came up with the prediction that the final figures for the year probably would show a total of 152,750,000 inhabitants. This is a gain of 2,750,000 over earlier estimates, and probably accounts for the persistent upsurge demand for goods, the source of which has baffled so many market authorities.

More consumers of goods in this country (2,750,000) than we believed existed heretofore, would require the paper industry to produce, on basis of 350 pounds per capita consumption, a total of 481,250 tons this year—for which no provision has been made.

It is this constant, underestimated, and generally unappreciated increase in population that not only has provided a maintained unprecedented consumption of goods at an increasing rate, but also has knocked into a cocked hat all calculations for adequately servicing this huge consumer consumption.

In the decade from 1930 to 1940, the increase in population was 7.8 millions, an average of 780,000 per year.

In the 1930-1950 decade, the increase was more than 21 million—almost three times greater, and an average of 2,100,000 per year—not only staggering in its effect, but continuing at the unparalleled rate of increase.

We have set our goal at 24 million tons of production for the paper industry for this year for two reasons: (1) because we've *got to produce it* to supply this increasing demand, and (2) because the present capacity of the Industry will permit it.

Figure it for yourself, Mr. Mill Executive. Make your own applications of your findings! For the consumption of paper products this year will exceed 29 million tons. *It might go to 30 millions.*

How Big Is Big?

THE QUESTION "How Big Should a Business Be" was the subject of an address given before General Electric stockholders by company President Chas. E. Wilson. At the close of his comprehensive economic outline of the relations of small business to big business, he touched a humorous note by saying that Abe Lincoln answered that question years ago when he said "a man's legs should be long enough to reach the ground."

Statistics reveal that there are almost four million small businesses in the United States.

Job Creation Is a Solemn Obligation

ONE-THIRD AS MANY VETERANS were training on-the-job under the GI bill for occupations in the manufacture of paper in 1949 as there were in 1947, according to a Veterans Administration survey. In 1949, job trainees learning to fill jobs in the paper manufacturing field numbered 146. The 1948 total was 223, and the 1947 total was an all-time high of 400.

No expense is spared in this country where those who will study may have an education at little or no cost, but a new haze is forming on the job horizon that is causing some of the nation's economists grave concern. With the country's population showing 150 million at the end of 1949, with another 2.5 million expected this year, the nation is now faced not only with the program of educational opportunity, but the problem of creating enough jobs to provide employment for the increasing number of workers.

Two phases of this subject—job creation and job stabilization—have been receiving grave consideration by members of the Chamber of Commerce of the United States. Means for creating more jobs to keep pace with the nation's growing population are being explored by this body of top economists.

From the Chamber's recent annual meeting, first proposals directed to management pointed out that:

1—It takes approximately $10,000 of capital investment to create every new job, and that the necessary investment in job-making facilities can take place only if investment funds are available and if the incentive to make the investment is strong enough.

2—Steadier jobs lead to improved industrial relations, feelings of job security, and reduced operating costs. Also, steady jobs mean lower unemployment compensation costs. Lay-off of a single employee may cost from $600 to $900 in unemployment compensation.

3—New products and new methods create jobs and raise living standards.

4—The creation of a favorable atmosphere for business expansion is a far better method of creating jobs than is the spending of the taxpayer's money to make work.

This subject takes on a seasonal accent because of recent press comments that a bumper crop of men and women will graduate from colleges this month and that they will find more job resistance than have the graduates of the past ten years.

Quoting from the Economic Research Department of the Chamber of Commerce of the U. S., "All thoughtful businessmen realize that business has a solemn obligation in job creation."

For Your Beater . . .
Better

Specify "GENERAL CHEMICAL"

At the critical "beater" stage, you can't be too careful about the chemicals you use. Time and tests have proved to leading paper producers—that for maximum sizing and pH control, it's best to *specify General Chemical* Aluminum Sulfate, and other basic chemicals made by America's foremost Alum manufacturer. That way you're *always* sure of highest quality, purity and performance!

ALUMINUM SULFATE

Standard: Lump; Ground, 99% thru 8 mesh, 95% thru 10 mesh; Powdered, 95% thru 100 mesh; Liquid, 32° Be.
Iron Free: Lump; approx. 2½", Ground thru 8 mesh, Liquid, 32° Be.

SODIUM SULFATE

(Salt Cake) . . . Paper Makers' Grade, thru 8 mesh, 95-99% Na_2SO_4.

Other General Chemical Products For the Paper Industry

- Aqua Ammonia
- Chromium Potassium Sulfate *(Potash Chrome Alum)*
- Disodium Phosphate *Anhydrous*
- Glauber's Salt *Crystal and Anhydrous*
- Hydrochloric Acid *(Muriatic)*
- Nitric Acid
- Sodium Bisulfite *Anhydrous*
- Sodium Fluoride
- Sodium Thiosulfate *(Hypo)*
- Sodium Metasilicate
- Sodium Silicate
- Sodium Sulfide
- Sulfuric Acid
- Tetrasodium Pyrophosphate *Anhydrous*
- Trisodium Phosphate
- Copper Sulfate
- Sodium Sulfite *Anhydrous*

BASIC CHEMICALS
GC
FOR AMERICAN INDUSTRY

51 YEARS OF SERVICE

GENERAL CHEMICAL DIVISION

ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

Offices: Albany • Atlanta • Baltimore • Birmingham • Boston • Bridgeport Buffalo • Charlotte • Chicago • Cleveland • Denver • Detroit • Houston Los Angeles • Minneapolis • New York • Philadelphia • Pittsburgh Portland (Ore.) • Providence • San Francisco • Seattle • St. Louis Wenatchee and Yakima (Wash.)
In Wisconsin: General Chemical Company, Inc., Milwaukee, Wis.
In Canada: The Nichols Chemical Company, Limited
Montreal • Toronto • Vancouver

Industry Groups Organize to Protest Duty Reduction

INTERNATIONAL TRADE is the current interest at Washington of the paper industry and will be for many weeks to come. Of primary importance is the program for a third round of duty rate reductions through Reciprocal Trade Negotiations to open at Torquay, England, late in September. Additional related issues, however, are those by which this Government is asked to approve the Charter for the International Trade Organization and legislation proposed in the guise of streamlining customs procedure.

On May 17, the American Paper and Pulp Association, the National Paperboard Industry, and at least half a dozen divisional associations in the paper industry filed briefs with the Committee for Reciprocity Information, protesting in most vigorous terms against any further reductions in existing tariffs. On June 5 and 6 representatives of these groups are scheduled to appear with oral arguments supplementing the formal briefs (more about this next month). Outstanding representatives of the industry will be the spokesmen for these groups. After these hearings government agencies will go into a huddle to study the arguments presented, and chart this country's course for the Torquay conference.

While none of the briefs have as yet been published, it is known that they follow a common argument, asserting that past trade agreements have placed this country on the equivalent of a free trade basis, when the depreciation of foreign currencies is computed. That there has been no true reciprocity as yet is shown by the fact that the United States rates are already lower than those of any other nation, and imports are being encouraged by these reductions, while other countries have imposed embargoes or equivalent restrictions on the purchases of American goods.

Briefs Demand Lower Canadian Rates

Citing the fact that Canada's rates are higher than our own on all grades of paper, the briefs demand that Canadian rates be reduced to the level of our own before any further cuts are effected.

The danger to the domestic printing paper and paperboard industries is pointed out with specific figures showing the extent to which United States markets have been invaded by Canadian and European papermakers, and the example of the newsprint industry is given as an example of the manner in which other grades are moving northward. The pending negotiations will have their major impact, if reductions on existing rates are agreed upon, on imports from Canada and the United Kingdom, with other European producers hoping to gain by lower rates on various special grades.

The pending negotiations involve grades of paper and paperboard ranging all the way from paperboard, printing paper, to high priced tissue grades, and such specialties as fancy papers.

An appeal has been issued to the members of the American Paper and Pulp Association to point out the danger of further reductions in duty rates, involving partial unemployment, to the chamber of commerce, business men's clubs, and fraternal organizations in their home communities as well as to the representatives of these communities in Congress.

P.I. Opposes U. S. International Trade Membership

Meanwhile the effort to enroll this country in the International Trade Organization is not expected to pass Congress before the summer adjournment. This charter would bind the United States as one member of an international organization, where it has only one vote, to pass laws regimenting domestic industry along the lines voted by foreign countries. The Paper Industry, as well as the National Association of Manufacturers and the United States Chamber of Commerce, has gone on record against United States membership.

Legislation claimed to be intended to stream line customs practice and facilitate imports is also likely to be held over until after the summer. This legislation includes proposals for changing the method of valuing foreign products, and is felt by some to nullify all our present anti-dumping legislation.

While domestic industry has reason to fear the long range effect of placing this country on a free trade basis, current operations continue at high levels. The first quarter of the year saw all production records broken, and earnings are well ahead of those in 1949. All forecasts envisage a continuance of the present good business until well into the fall, despite a probable summer dullness. High grade sulphite pulp is reported to be in short supply, though supply is sufficient to meet demand in the lower paper grades. The demand for kraft paper is dropping, though the mills are still several weeks behind orders. Paperboard mills are running on a five day week basis, as an average, as compared with six days earlier in the year.

The Federal Trade Commission has promulgated Trade Practice Rules for the fine and wrapping paper distributing industries. Legislation to strengthen the antitrust laws progresses slowly in Congress and changes in social security legislation continues to be debated in congressional committees.

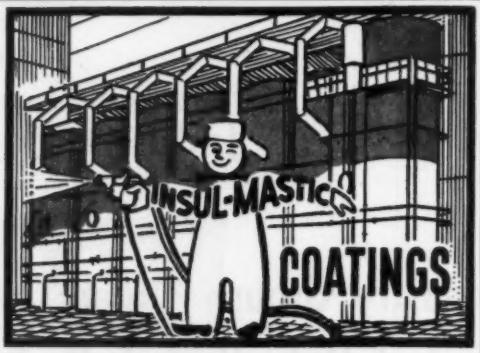
The president has faced defeat on a number of his proposals for reorganization of government agencies, Congress in many cases turning thumbs down on the proposals as giving too great authority to the Executive.

Association Gets Govt. Award for DS

The part which the paper industry through its various agencies has cooperated with Government agencies in the suppression of counterfeiting was exemplified in New York when Philip O. Deitsch, managing director of the Gummed Industries Association, was presented an Award of Merit by the Government.

The presentation cited Mr. Deitsch for distinguished service in the appre-

"LET'S GET DOWN to BRASS TACKS"



A well known testing laboratory* has reported that Insul-Mastic has a maintenance-free-life approaching fifty years. An eight year continuous test in a Weather-O-Meter (equivalent to approximately 57 years outside weather) has corroborated this finding. Other laboratory tests and actual jobs have shown that severest conditions do not affect the durability of Insul-Mastic.

Why not get "down to brass tacks" with our engineers and discuss your coating problems.

*Name on request.

Insul-Mastic Coatings can serve you in these four basic ways:

Preventing corrosion.
Vaporseal over thermal insulation.
Cork-mastic insulation.
Waterproofing and resurfacing.

Insul-Mastic Corporation
OF AMERICA
1157 OLIVER BUILDING · PITTSBURGH 22, PA
Representatives in Principal Cities

hension of a counterfeit postage stamp ring. He assisted during the war in the apprehension of another group which was issuing bogus war savings stamps. For many years Government agencies have turned to the paper industry for assistance in running down sales of paper to counterfeiting groups, by securing assistance in identifying the paper used by these criminals.

Another example is the request by the Secret Service that paper merchants report all sales of one or more reams of 100 percent rag paper sold to any persons unknown to the merchants, or not in the paper trade.

Appropriation Asked for Wood Pest Control

Western Congressmen are asking that an appropriation of $4,500,000 be voted for control of insect pests, such as the various beetles, which cause heavy losses in standing pulpwood. Colorado Congressmen have stated that a proposed $15,000,000 investment in a pulp mill for Western Colorado may be imperiled unless funds are authorized to control various wood pests in the Mountain States. The Columbine Development Company of Grand Junction, Col., has bid $16,000,000 for Government-owned beetle infested pulpwood in the White River Forest Area, but to secure this contract the company must agree to build a large pulp mill.

Financial

▶▶▶ PAPER MILL SECURITIES joined in the general advance in prices in the country's securities markets, the past month witnessing the establishment of new high average values throughout the principal markets for listed securities. Many paper securities reached record high figures, and many others were priced well above any record for many years past.

American Writing Paper Corp.—Net profit for the first three months of 1950 was $22,105 as compared with a deficit of $14,242 for the same period a year ago.

Brown Co.—Net income for five four week periods beginning Dec. 1 was $923,000 as compared with $866,500 for the comparable period a year ago.

Certain-teed Products Corp.—Net income for the quarter ended March 31 was $1,085,125 as compared with $831,056 for the same quarter in 1949.

Continental Diamond Fibre Co.—Net income for the quarter ended March 31 was $156,899 as compared with $165,284 a year ago.

Eastern Corp.—Income for the quarter ended March 31 was $339,046 as compared with $55,482 a year rago.

Gaylord Container Corp.—Net earnings for the first quarter of 1950 were $954,163 as compared to $1,250,158 for the same period a year ago.

Hammermill Paper Co.—Net income for the March quarter, 1950 was $356,243, as compared to $214,102 for the same period a year ago.

Hollingsworth & Whitney Co.—Net income for the quarter ended April 2 was $345,289 as compared with $785,387 for the comparable quarter in 1949.

International Paper Co.—Net profit for the quarter ended March 31 was $16,295,248, as compared to a net profit of $13,814,831 for the same quarter in 1949.

Kimberly-Clark Corp.—Net profit for the first quarter was $769,274 as compared with $1,349,414 a year ago.

Minnesota & Ontario Paper Co.—Net income for the quarter ended March 31 was $965,824 as compared with $881,054 a year ago.

National Container Corp.—Net profit for the first quarter was $935,967 as compared to $585,324 for the comparable period in 1949.

Oxford Paper Co.—Net income for the first quarter was $517,391 as compared with $366,368 a year ago.

Paraffine Cos., Inc.—Net income for the quarter ended March 31 was $626,335 as compared with $334,900 a year ago.

Puget Sound Pulp & Timber Co.—Net income for the first quarter of 1950 was $239,373 as compared with $506,433 a year ago.

St. Croix Paper Co.—Net income for the March quarter was $285,682 as compared with $345,029 for the comparable period in 1949.

Scott Paper Co.—Net income for three months ended April 1 was $1,733,730 as compared with $1,176,607 for the comparable quarter a year ago.

Union Bag & Paper Corp.—Net income for the quarter ended March 31 was $2,349,395 as compared with $2,166,736 for the same quarter in 1949.

United Wall Paper Inc.—Deficit for three months ended April 1 was $380,074 as compared with a profit of $721,720 for the comparable quarter a year ago.

Paper Mill Corporate Changes

Franconia Paper Co.—A new company by this name has purchased the Lincoln, N.H., properties of the Marcal Paper Company, for a reported price of $1,061,000, thus concluding a reorganization under the auspices of the Federal Court. The sale includes most of the village of Lincoln, the pulp mill at Livermore Falls and timber lands in Maine and New Hampshire. This is the old Parker-Young property. The president of the Franconia company is Anthony Taccetta, and the main office will be at East Paterson, N.J. The new company will continue to producce sulphite bond and similar papers.

Cuneo Press, Inc.—A two percent stock dividend has been authorized by stockholders, and the authorized amount of common shares is expected to be increased at a later meeting. This company controls the former Combined Locks Paper company, which is now operated as a subsidiary.

New York Stock Exchange—Stocks

	Closing Prices May 20	April 25
A.P.W. Products	4	* 3⅝-3⅞
Celotex	19	18⅛
Same Preferred	127⅛	127⅛
Certain-teed Products	18⅛	17⅞
Champion P. & F. Co.	39⅜	33
Same Preferred	104½	103
Chesapeake Corp.	28	28¼
Continental Diamond	10⅜	9⅜
Container Corp.	47	45½
Same Preferred	105	103½
Crown Zellerbach	35¼	32½
Same Preferred	103⅜	105
Same $4 Preferred	106½	*103-105
Dixie Vortex	45⅜	45½
Same "A"	54⅜	* 52½-53¼
Eastern Corp.	15	16¼
Robert Gair	9¼	8
Same Preferred	18¼	* 17⅞-18
Gaylord Container	20⅜	19
International Paper	46	40⅜
Same Preferred	108	106½
Kimberly-Clark	38¼	21⅝
Same Preferred	152½	127
McAndrews & Forbes	40	40¼
Marathon	30⅜	29⅛
Masonite	65¾	63
Mead Corp.	23	21
Same Preferred	90	90
Same 2nd Preferred	45⅜	* 41-43⅛
National Container	8⅜	8
Paraffine Cos.	16⅜	16⅜
Same Preferred	99⅜	*100¼-101
Rayonier, Inc.	33½	28⅝
Same Preferred	33¼	31⅝
Scott Paper	90½	85
Same $3.40 Preferred	98	* 96-97
Same $4.00 Preferred	108¼	*104¼-107½
St. Regis	9⅜	8¼
Same Preferred	90	88
Sutherland Paper	40	* 39¼-39½
Same Preferred	*110¼-112	*110¼-111
Union Bag & Paper	30¼	27⅝
United Board & Carton	9⅛	* 8⅛-8⅜
United Wall Paper	3⅛	4⅛
Same Preferred	24⅜	26
U.S. Gypsum	133½	122½
Same Preferred	188½	*186-187
West Va. P & P Co.	53⅛	46
Same Preferred	110⅛	*110½-111

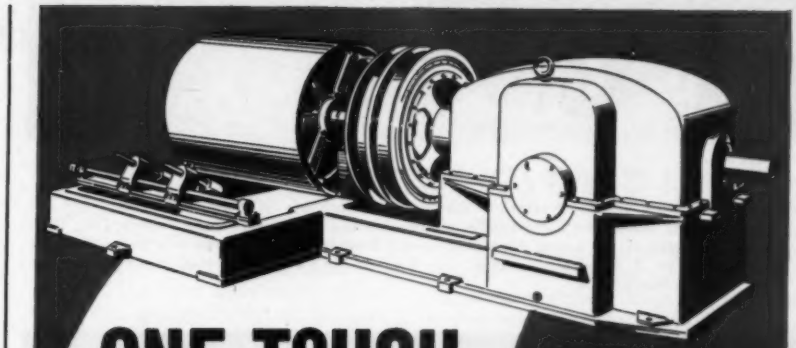
New York Stock Exchange—Bonds

A.P.W. Products 3%	81	* 80-83
Celotex 3¼%	101⅝	101½
Champion P. & F. Co. 3½	103¼	*103-103⅜
Mead Corp. 3%	102⅛	102⅛

New York Curb Exchange—Stocks

Am. Writing	7	* 6¾-7
Great Northern	40⅜	40¼

*Closing Bid and Asked Prices



ONE TOUCH
IT STARTS OR STOPS
SMOOTHLY

● Whether installed on the calender or on other paper mill sections, Fawick Airflex Clutches provide machines with many operating advantages.

FULL OPERATING POWER is insured by the 360° constant-velocity contact with the friction surface.

SENSITIVE TORQUE CONTROL is provided by the torque-transmitting rubber tube.

SHOCK LOAD ABSORPTION is accomplished by the unrestricted flexible rubber tube.

These and many other features give users of Fawick Airflex Clutches higher machine efficiency, higher operating safety, and better finished products.

All desirable clutch characteristics are built into Fawick Airflex units

FAWICK Airflex CO., INC.
2919 CLINTON ROAD CLEVELAND 11, OHIO

FAWICK CLUTCHES = + + + = PEAK EFFICIENCY

Executives

At the opening session of the Annual Executives Conference held at the Institute of Paper Chemistry were: (L to R) D. K. Brown, pres., Neenah Paper Co., A. B. Layton, vice pres., Crown Zellerbach Corp.; Westbrook Steele, pres., Institute of Paper Chemistry; Louis E. Leverone, pres., Automatic Canteen Co. of America and Nationwide Food Service, Inc.; D. C. Everest, chairman of the board, Marathon Corp.; Ernst Mahler, executive vice pres., Kimberly-Clark Corp.; W. J. O'Brien, vice pres., The Glidden Co.; Frazier D. MacIver, executive vice pres., Phoenix Hosiery Co.

Members of the Institute staff presented a panel discussion on "Some of the Major Technical Problems Facing the Industry" at the Friday morning session of the conference. Left to right are: Dr. Loren Forman, Dr. T. A. Howells, Dr. Roy Whitney, Dr. J. A. Van den Akker, John G. Strange, Institute vice pres., who was the moderator; R. C. McKee, Dr. Ruth Shallcross, Dr. Willis VanHorn, C. B. Sitterson, Jr., and Dr. Harry F. Lewis

As Allen W. Dulles, international attorney, entered the North Shore Golf Club to address the last night session of the Conference, he is greeted by: (L to R) George Dyke, pres. of Robert Gair Paper Co.; Karl E. Stansbury, chairman of the board, Thilmany Pulp and Paper Co.; Westbrooke Steele, Institute president (next is Mr. Dulles); and Ernst Mahler, executive vice pres., Kimberly-Clark Corp. and chairman of the Institute board

Renewing friendships at the conference are: (L to R) M. S. Wunderlich, Minnesota and Ontario Paper Co.; C. A. Fourness, of Kimberly-Clark Corp.; Donald Jackson, of Hammermill Paper Co.; and Dr. Harry F. Lewis, dean of the Institute

▸▸▸ SOME THREE HUNDRED executives of the pulp and paper industry attended the Fourteenth Annual Executives Conference of The Institute of Paper Chemistry at Appleton, Wis., May 18th and 19th. Held during recent years to promote better acquaintance of the members with the progress and various activities of the Institute, this meeting marks its twenty-first anniversary.

An unusually fine program was given added interest by the appearance, as banquet speaker, of Allen W. Dulles, (brother of John Foster Dulles) international attorney, diplomat and author, who discussed our relations with Russia and analyzed the events leading up to the present cold war with the Communists. He pointed out that the situation is not as hopeless as it sometimes appears and outlined some of the methods by which our country can project its ideas and ideals behind the Iron Curtain.

The Program

The conference opened on Thursday, May 18, with an inspection tour of the Institute and its facilities. Then, after luncheon at the North Shore Golf Club, the opening session was held wherein representatives of allied industries told of their experience and association with the Institute of Paper Chemistry. It was at the banquet Thursday evening that Mr. Dulles spoke.

Friday morning's program consisted of a panel discussion outlining some of the major technical problems facing the industry. Friday afternoon Westbrook Steele gave his annual report covering the year's operation of the Institute. At the close of this session, Ernst Mahler, executive vice president, Kimberly-Clark Corp., announced changes in titles of the officers of the Institute which had been approved at the Trustees meeting held on May 17. Present titles are as follows: chairman of the board of trustees, Ernst Mahler; vice chairmen, D. C. Everest and John L. Riegel; president, Westbrook Steele; vice president and treasurer, John G. Strange; secretary, C. B. Sittersoh, Jr.; assistant secretary, Doris Pickert.

Industries Aided by Institute

The wide diversification of the objectives of the Institute and their effects on allied industry were brought out in the Thursday afternoon session presided over by D. C. Everest, Marathon Corp. Louis E. Leverone, president of Automotive Canteen Co. and of Nationwide Food Service, Inc., described his early contacts with the Institute

Attend Institute Conference

back in the early 1930's when he was connected with Stein-Hall Co., adhesive manufacturer. A study of starch and its relationship to cellulose fiber was carried out by the Institute for his company. This aided in the solution of many problems involved in the use of starch and helped put the starch industry on a sound financial basis.

Another firm that utilized the services of the Institute is the Glidden Co. W. J. O'Brien, vice president of this company, credited the Institute with aiding his company in its work on the development of alpha protein and numerous other soy bean products.

In his absence, a paper prepared by H. R. Wemple, vice president of Texas Gulf Sulphur Co., was read by Dr. Edwin Shoenberger of the Institute staff. This paper outlined the service the Institute rendered in aiding the successful development of a sulphur burner for use in the sulphite process. It was not until the help of the Institute was enlisted that a full-scale plant-size burner was put into operation. The burner is now being used in many pulp mills.

Even the hosiery industry has benefited directly from the work of the Institute, according to F. D. MacIver, executive vice president of the Phoenix Hosiery Co. He pointed out that scientists at the Institute took his company's processes one by one and by improving them aided in trebling plant output.

Technical Problems Facing the Industry

Increased productivity is the result of technical progress. Technical problems which must be overcome in the effort to further increase productivity in the pulp and paper industry were discussed by a panel under the leadership of John G. Strange, vice president of the Institute. Participating in the discussion were Dr. Harry F. Lewis, Dean of the Institute; C. B. Sitterson, Jr., secretary of the Institute; Dr. Willis van Horn, head of Biology Group; Dr. Ruth Shallcross, economist; Dr. Loren Forman, co-ordinator of Applied Research; R. C. McKee, chief of Container Section; Dr. T. A. Howells, chief of Plastics and Resins; Dr. Roy Whitney, head of Chemical Engineering; Dr. J. A. Vanden Akker, head of the Physics Group.

Subjects covered in this discussion included Wood Utilization, Semichemical Recovery, Effluents, Measurements, and Pests. While many of the problems discussed have been with us a long time, it is important that they not be regarded as necessary evils. By vigorously and systematically attacking such problems it will be possible to increase further the productivity of this industry and raise its contribution to our over-all economy.

Wood Utilization—Major points involved in improved wood utilization include: (1) more versatile use of various wood species heretofore not suitable for pulp and paper; (2) greater use of wood waste; (3) better forestry practices and the improvement of wood handling methods to reduce logging waste; (4) more complete utilization of the wood fiber that enters our pulp mills.

Semichemical recovery—Semichemical processes are gradually becoming of paramount importance because they provide increased yields of pulp from wood. Use of such processes has been somewhat limited, but considerable commercial expansion is being experienced in this field. Among the factors which appear to limit the growth of the neutral sulphite process is that of chemical recovery. Even where the kraft semichemical process is used, the operations must be large enough to make possible efficient chemical recovery.

Effluents—From the standpoint of productivity, the greatest effluent problem seems to lie in the sulphite process wherein we are throwing away about one-half of the wood we are using. There are many different opinions as to how this problem can be solved. While the utilization of waste sulphite liquor can be accomplished by converting to by-products or to energy, it appears that conversion to energy by means of evaporation and burning may be expected to materialize in the relatively near future. While many by-products have been developed from this liquor, a satisfactory process has not yet been developed to utilize the large volume available.

Nonfibrous materials—The importance of nonfibrous materials which contribute a wide variety of properties to paper and paperboard was reviewed by the panel. Most of these have been selected and used on an empirical basis and it was pointed out that progress depends on finding out more fundamental information regarding the behavior of these materials with relation to fiber.

Measurement — Measurement and control of energy and matter are fundamental in the development of greater productivity in any industry. While much progress has been made in the pulp and paper industry, many problems still remain. Some of these are as follows: (1) the need for better methods to measure wood; (2) evaluation, both qualitative and quantitative, of pulp at various stages of preparation; (3) the need for more effective evaluation of coating materials, such as clays; (4) problems of measurement regarding the specific uses of paper such as printing and packaging. It was pointed out that the subjects touched upon were merely examples and not necessarily even the best examples of important problems of measurement facing the industry. This particular field is one of great importance, and there is no doubt of the progress that can be achieved by systematic research.

Pests—Pests of various kinds are confronted in all phases of operation in our industry: in the forests, in the woodyards, in the pulp and paper mill, and in some cases in the finished product. While often not realized, these pests cost the industry a great deal and certainly have the effect of decreasing our over-all productivity. Insects of various kinds attack our forests. Many species of fungi, not only destroy our forests, but even destroy wood stored in wood-yards. Slime forming microorganisms do much to decrease productivity in our mills. Further research in the elimination of such pests is quite essential.

Annual Report by Westbrook Steele

In his annual report, Westbrook Steele, president of the Institute, outlined the progress that has been made in the Institute's twenty-one years of operation. He restated the purposes and functions of this organization, pointing out that the Institute has three primary objectives: (1) educating and training men for the pulp and paper industry; (2) gathering and maintaining a library of all available material on the pulp and paper industry, its chemistry and processes; and (3) to carry on research projects for the pulp and paper and allied industries.

In discussing the educational functions of the Institute, Mr. Steele noted that 297 students had matriculated at the Institute. Of this total, 55 per cent are employed in the pulp and paper industry, 17 per cent are associated with allied industries, 13 per cent are still studying at the Institute and the remaining 15 percent are occupied in graduate studies, teaching, or are in unidentified fields. Of the 101 graduate Ph.D's turned out by the Institute since its inception, 47 per cent have production responsibilities in industry, 43 per cent have research responsibilities while the remaining 10 per cent are in other fields.

In addition to the regular academic

program, special courses of training are available for employees of member mills. Now, however, there is in preparation a series of short courses to explore special areas of the pulp and paper manufacturing processes. These will be available to technically trained men already in our industry.

The important work of the library and editorial staff is widely recognized. The library, accumulated by the Institute, is one of the finest. Abstracts of current literature published in *Library Notes* is widely distributed and enjoys both a scientific and literary distinction. During the past year, the staff of the Institute has published fifty scientific articles in various professional journals.

The third important phase of the work of the Institute is to carry on research for the industry which is impractical for individual companies to handle in their own laboratories. During the past 15 years the Institute has handled 1,529 projects of this nature. Out of the research activities of the Institute 153 domestic and foreign patents have been allowed while others are in process. Acknowledgement was made to the Fourdrinier Kraft Institute which recently turned over its patent rights on new fiber board products developed for it at the Institute of Paper Chemistry.

A rather unique achievement of the Institute is the recent development of a compound, derived from sulphite waste liquor, that has been found useful in treating disease. This compound has undergone clinical tests at Vanderbilt University and has been reported as the first effective cure for histoplasmosis, a hitherto consistently fatal disease in children. Because of the unusual nature of this development, the Institute supplied funds necessary to pursue the necessary clinical investigation. It was pointed out that insofar as can be ascertained, this is the first time that one educational institution, on its own account and from its own research reserves, has financed research at another institution of higher learning.

In discussing the growth and development of the Institute, Mr. Steele discussed plans for expansion of the physical facilities of the Institute. It has been necessary to remodel old buildings to provide space requirements for current operations. A new building is planned which will provide an auditorium, exhibition hall and various classrooms.

Three more companies have been added to the Institute's membership list during the past year: Great Northern Paper Mills, Gilman Paper Co., and Hercules Powder Co.

Complete proceedings of this conference will be published in booklet form by The Institute of Paper Chemistry.

Dr. Irwin Pearl of Institute Discovers Miracle Drug

Tireless research into the character of waste sulphite liquor, its components and possible use has brought an increasing list of discoveries. But the most recent and sensational of these findings was revealed May 10 with an announcement by Dr. Amos Christie, head of the department of pediatrics at Vanderbilt University School of Medicine, at a meeting of the American Pediatric Association in French Lick Springs, Ind., of a miracle drug which apparently will conquer Histoplasmosis, heretofore considered an incurable child's disease.

Dr. I. A. Pearl

This amazing discovery is the result of research conducted by Dr. Irwin A. Pearl, of the staff of the Institute of Paper Chemistry, Appleton, Wis. Adequate funds for clinical exploration were not available at Vanderbilt University, so the Institute provided a research grant to further clinical investigation. A great quantity of information was accumulated, new chemical processes were developed and new compounds resulted.

Dr. Pearl's compound is vanillic acid. The ester of this material, called ethyl vanillate, has been found to have specific fungicidal properties. The fungicide was used during the war to prevent molding of foodstuffs in the tropics.

Notable among the organized groups conducting exhaustive research into the use of spent paper mill liquors is the Sulphite Pulp Manufacturers Research League, a group of sulphite mills in the Fox River Valley and other parts of Wisconsin and Michigan.

Hoberg Sponsors 18 Trees for Tomorrow Camp Scholarships

Eighteen high school students from Green Bay, Wis., were sponsored by Hoberg Paper Mills, Green Bay, at the Trees for Tomorrow, Inc., conservation camp held at Eagle River, Wis., May 3-6.

The program was part of the school curriculum for students interested in forest conservation. The camp, for which tuition was $16.50 per student, was staffed by conservation experts from leading organizations who demonstrated correct conservation measures, and directed each student in planting a tree of his own in specially designated plots. Similar camps will be held throughout the summer for both students and adults.

Howard Smith Mills To Install Million-Dollar Steam Plant

As a replacement for an obsolete stoker plant now in operation, Howard Smith Paper Mills Ltd., Montreal, P.Q., will construct a new $1,000,000 high-pressure steam plant at the firm's Cornwall, Ont. mill.

The new modern steam installation, scheduled to begin construction in July and to go into production late in 1951, will increase efficiency and reduce operating costs of the plant, facilities of which are overloaded due to the high-level of operation in recent years. This construction program is part of the company's long-term program of plant rehabilitation and expansion begun three years ago. In order to maintain production the modernization, which in 1949 cost $3,000,000, is being carried out in separate stages which will last for several more years.

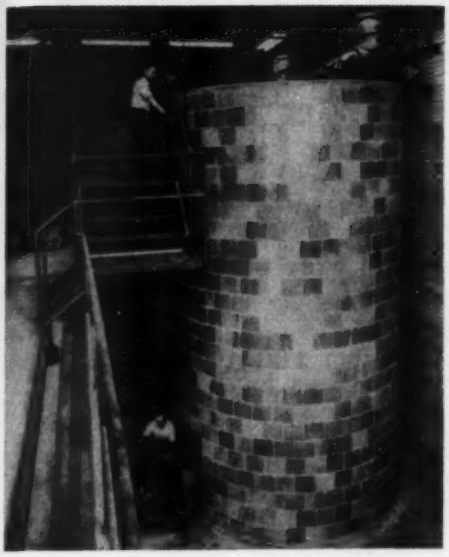
Frontenac Paper Mill Destroyed by Fire

A fire which broke out May 17 destroyed the Frontenac Paper Mill, Dexter, N.Y. Damage, estimated at $100,000, was so complete that only the stone walls of the mill were left standing. The interior of the plant was demolished; only a finishing room at the northwest corner of the building and an office above it, both sealed off by automatic fire doors, were saved.

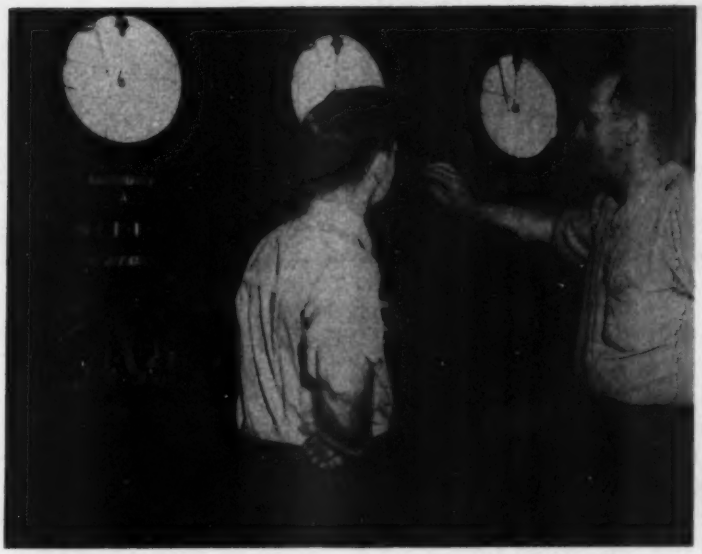
The mill has been owned since last February by the Twin Falls Paper Co., Inc., which took it over from the Dexter Sulphite Pulp and Paper Co. (Cf. P. I., Mar., 1950)

The mill was insured, and the loss reportedly covered to the satisfaction of the owners. Although unused for nearly a year, considerable heavy equipment including a paper machine and eight beaters was still in the building, and was destroyed.

MODERNIZATION OF PART of the Dryden Paper Co., Ltd., plant at Dryden, Ontario, this year is expected to cost $375,000. Production of the plant has increased from 19,000 tons in 1940 to 48,000 tons yearly at the present time.



Inspecting one of two 19,000-gal. Stebbins tanks at Mando's new color room are: Elmer Holmes, chief chemist, and E. J. Carriveau, supt. pulp and paper manufacture. Roy Sturdy checks agitator gear at base



Control panel (Shartle-Dilts) governing operations of the mixing tanks in the new color room at Fort Frances mill. Elmer Holmes, chief chemist, and Roy Sturdy discuss various control features

New Color Room Completed at Mando's Ft. Frances Mill

▶▶▶ With the completion of its new color room which was completed last month, the Fort Frances, Ontario, mill of Minnesota and Ontario Paper Co. expects to improve control of the quality of its groundwood specialty papers.

The color room is contained in a new three-story, 48 x 54-ft. building, which was constructed in 1949 on the west wall of the mill building adjacent to the No. 5 paper machine room.

Second floor of the building contains two cylindrical mixing tanks, each with a capacity of 19,000 gallons, where the ingredients of the various furnishes, which are added to the pulp stock, will be blended with the stock in the proper proportions. Uniformity of successive batches can be controlled in the blending tanks so that each is identical. This is accomplished by means of modern instruments and control apparatus that have been installed as part of the color room equipment. Furnish is the name given to clay, alum, size, color, and other chemicals that are added to the stock to give the finished paper the required qualities. This furnish is added to the stock just prior to its journey over the paper machine.

The two blending tanks are 11 feet in diameter by 19 feet high. They are finished with glazed tile both inside and out. The present two tank set-up is for one-machine operation. Space has been provided in the building for the addition of two more tanks to take care of two-machine operation when this becomes desirable.

In operation, the stock is pumped into the mixing tanks, the furnish is added in accurately controlled amounts, and the whole is thoroughly mixed by agitators in the tanks. When properly mixed, the stock goes to the paper machine.

THE POLLUTION DEADLINE issued to five paper mills in Oregon, including Crown-Zellerbach's West Lynn and Lebanon plants; Oregon Pulp and Paper Co., Salem; Spalding Pulp and Paper Co., Newberg; and Publishers Paper Co., Oregon City, has been extended to May 1, 1952. Crown-Zellerbach has only recently satisfied similar pollution charges at the Camas, Wash., pulp and paper mill. (Cf. P. I., April, 1950 and May, 1950)

1950 Herty Medal Awarded to Dr. Ralph W. Bost

The 1950 Herty Medal for outstanding contributions to chemistry in the Southwest, awarded by the Chemistry Club of the Georgia State College for Women to a scientist selected by the Georgia section of the American Chemical Society in honor of the late Dr. Charles H. Herty, originator of the process for making paper from Southern pine, was recently awarded to Dr. Ralph W. Bost.

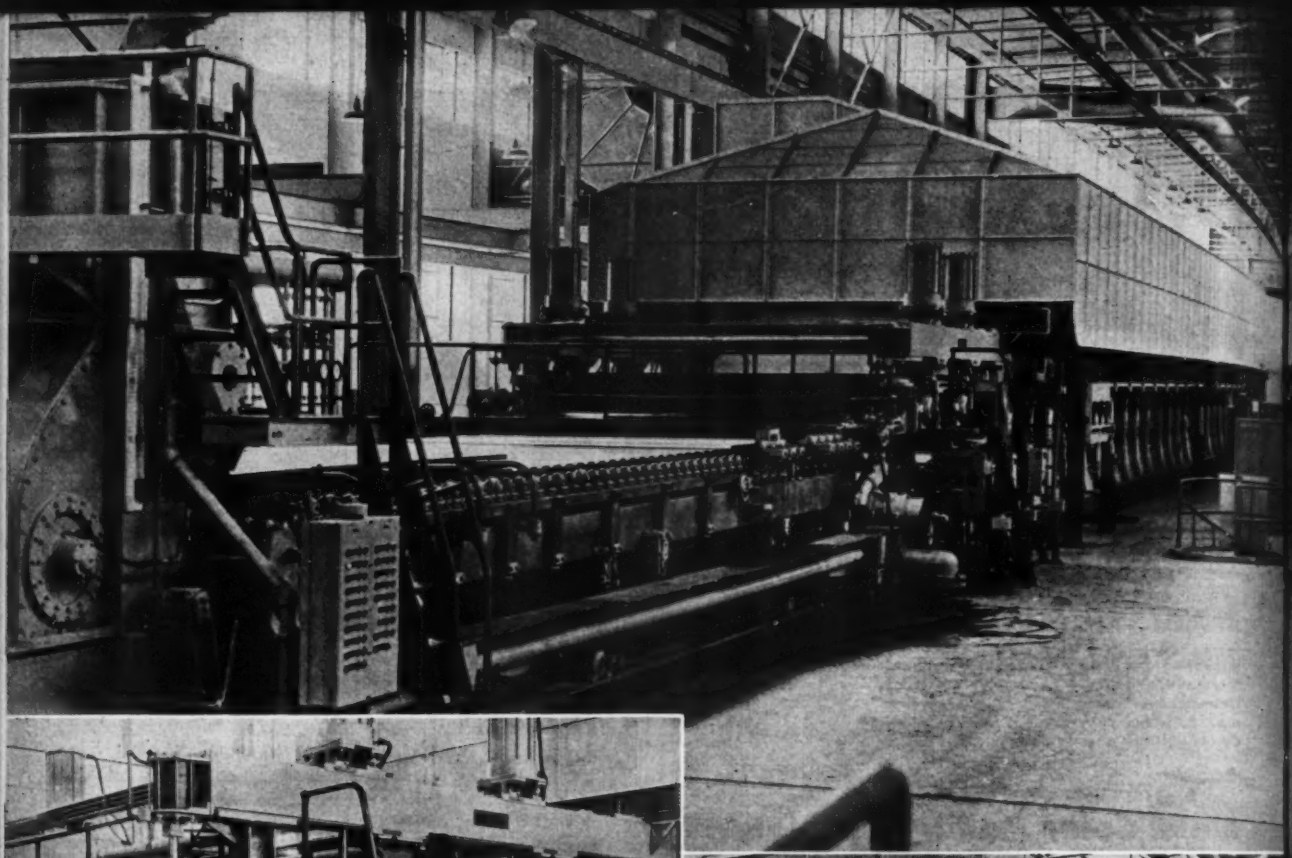
Dr. Bost, head of the chemistry department of the University of North Carolina, has done most of his chemical research in the field of the relation of molecular structure of chemical compounds to their physical properties.

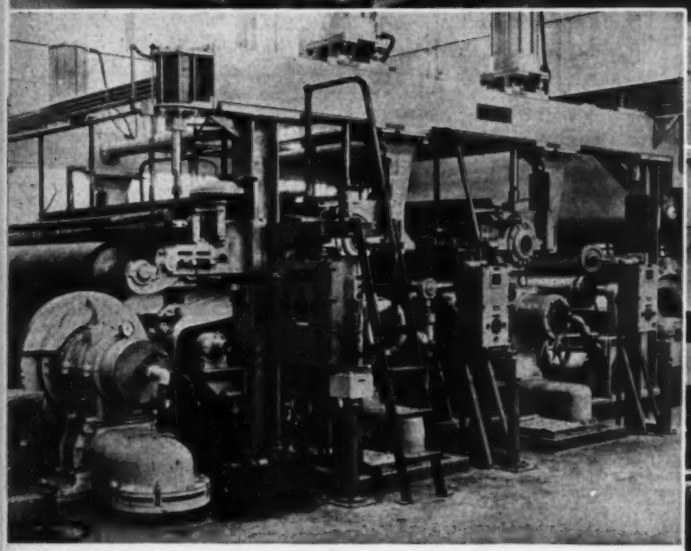
Scott Paper Plans New Office Building

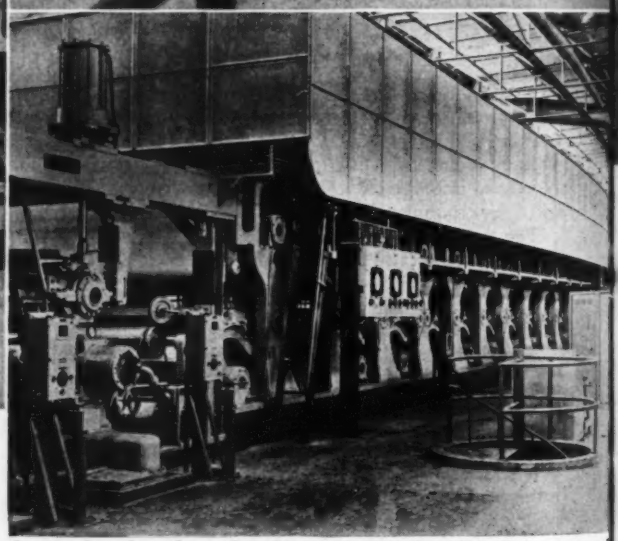
Approval of plans for an eight-story office building at the Chester, Pa., paper manufacturing plant of Scott Paper Co. has been applied for from the Chester Zoning Board. The initial building, expected to cost approximately $1,425,000, will be four stories and should be ready for occupancy in about a year; other floors will be added as required.

The building will be fire-proof construction with white face brick exterior similar to the other company buildings in the area. The new structure is designed to accommodate the executive staff and about two hundred sales, advertising, public relations, engineering, technical service, purchasing, and personnel employees, with certain laboratory and medical facilities.

INCORPORATION ARTICLES were granted the Northeast Pulp Co. at Dover, Del., April 6. The capital is 1000 shares of no par value, and principal offices of the firm are at Wilmington, Del.







FEATURES OF 156″ PUSEYJONES FOURDRINIER MACHINE AT FIBREBOARD

Improved type Flow Spreader combined with 8 ft. high head adjustable slice, all Neoprene lined.

Fourdrinier Part suitable for a wire 100 ft. long and 156″ wide, equipped with 36″ suction couch, lump breaker roll with improved raising and lowering mechanism, 7–7″ wide suction boxes, dandy roll, "Rapi-drape" wire changing device, and adjustable wire pitch arrangement.

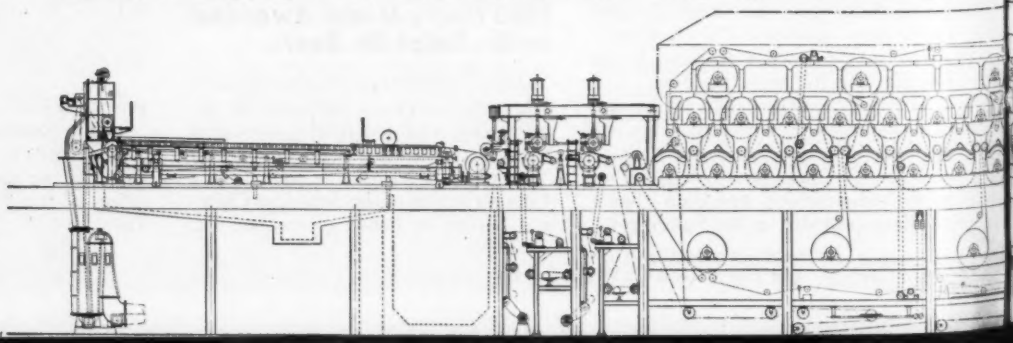
Press Part of Simplex close-coupled design with 28″ rubber covered first and second main presses and Vickery felt conditioners.

Dry Part in two main sections having one upper and lower felt on each section; first section comprises 20–60″ paper and 6–60″ felt dryers; second section comprises 20–60″ paper and 2–60″ felt dryers; Bowser lubricating system and main dryer bearings; rope carrier device for threading the sheet through the dryer sections; improved type enclosed gearing, latest type steam joints with dual revolving siphons, and automatic motor-operated felt tension control devices.

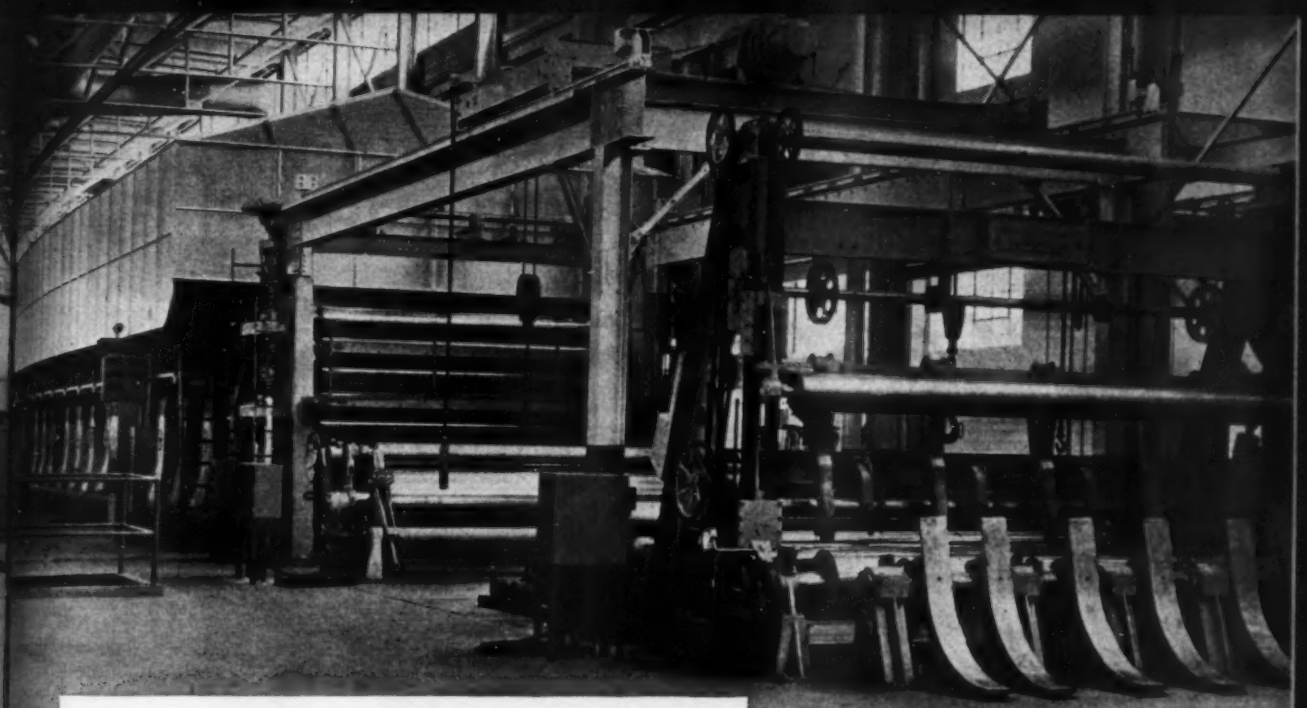
Calender Stack comprising 7 rolls with independent Bowser oiling system for all roll bearings; a pneumatic nip loading system.

Pope type Uniform Speed Reel improved design, with pneuma adjustable loading mechanism.

Puseyjones Winder with hydrau operated roll unloading mechanis



Line drawing of new machine. Maximum speed is 1200 feet per minute with G.E. multiple generator type sectional electric drive.



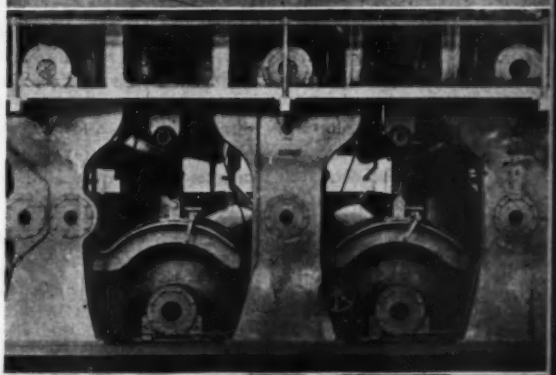
ANOTHER FIRST FOR FIBREBOARD

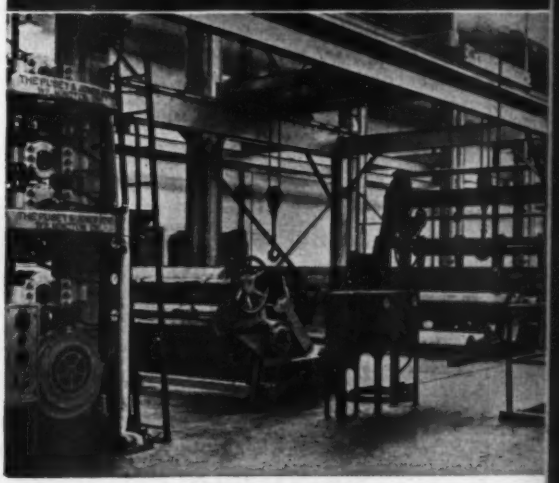
Here is the Puseyjones Fourdrinier Machine now in operation in the fine new mill of Fibreboard Products, Inc., East Antioch, California. In every detail from wet end to winder, the new machine reflects the latest developments in the papermaking art. It is producing .009 corrugating paper from furnish prepared by the latest semi-chemical process.

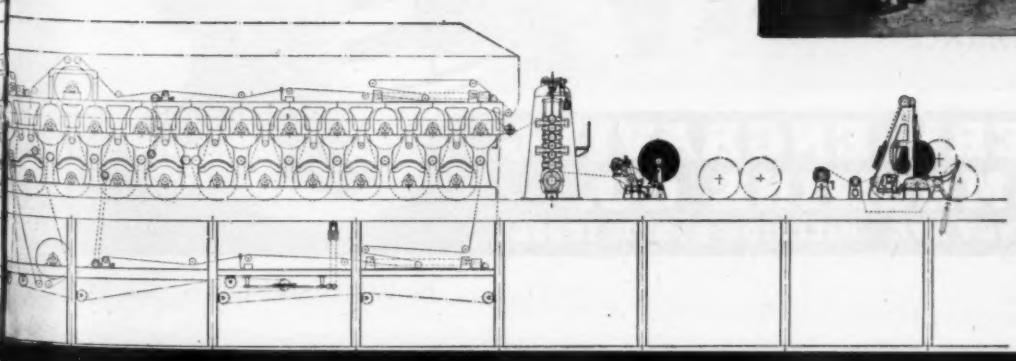
Whatever your papermaking problem, put it up to Puseyjones—for machines that give continuous, uniform production at high speeds.

THE PUSEY AND JONES CORPORATION
Established 1848. Builders of Paper-Making Machinery
Wilmington 99, Delaware, U.S.A.

THE SIGN OF TRADE MARK SUPERIOR QUALITY



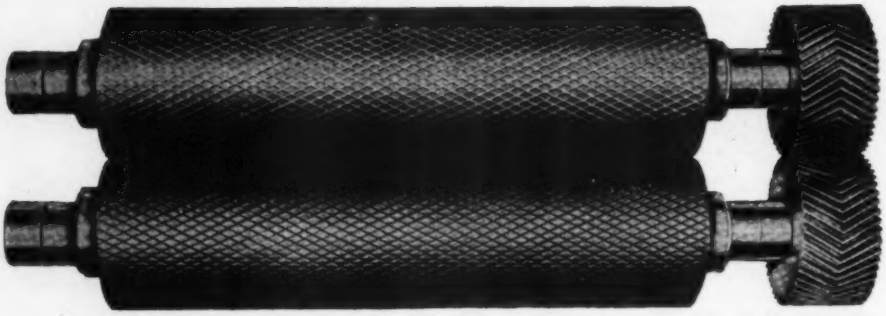




All rolls in the new Puseyjones Fourdrinier Machine at Fibreboard are equipped throughout with roller bearings, with the exception of lower calender roll.

The Greatest Development in the History of Embossing

ENGRAVED *Matched Hardened* STEEL EMBOSSING ROLLS



By special process of precision engraving and Electronic Controlled Flame Hardening, Engraved Matched Hardened Steel Embossing Rolls with matched herringbone gears are so perfectly mated that almost any material can be embossed with a uniform pattern, that yard after yard, day after day, will be absolutely the same.

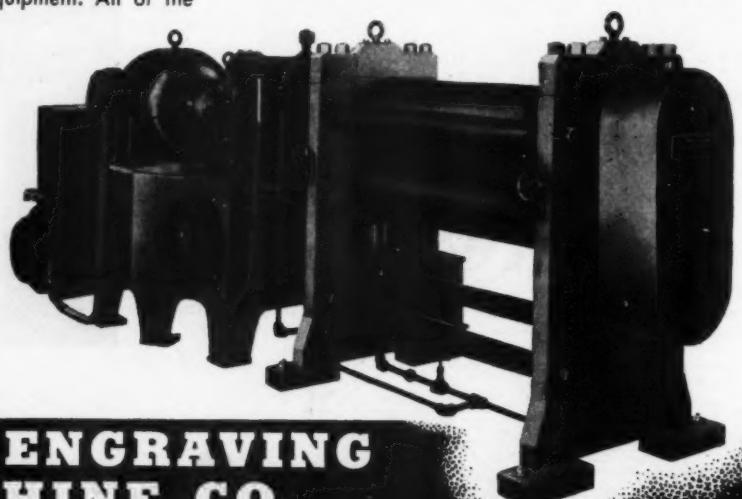
Engraved Matched Hardened Steel Embossing Rolls require no make-ready or running-in, eliminate costly backup roll replacement and lost production due to fractures in backup roll caused by splices and material variation.

Engraved Matched Hardened Steel Embossing Rolls in the new Master Hydraulic Embossing Machine now make it possible to rotary emboss at high speed many materials, two or more full width strips or sheets at one time if desired, as well as materials that heretofore could only be embossed on slow, cumbersome equipment.

MASTER *Hydraulic* EMBOSSING MACHINE

The Master Hydraulic Embossing Machine with its sturdy solid steel housings, heavy duty SKF spherical bearings, Reliance V-S drive, Vickers hydraulic power unit, fingertip controls, and other fine mechanical and electrical features, has been designed and built by practical Engineers who have devoted years of study in the development and construction of high speed embossing equipment. All of the undesirable features and mechanical drawbacks in old-style embossing machines have been eliminated. The Master Hydraulic Embossing Machine coupled with the development of a special process to Engrave Matched Hardened Steel Embossing Rolls definitely makes the combination the "Greatest Development in the History of Embossing."

- **UNIFORM EMBOSSING**
- **SPEED UP TO 1000 FEET PER MINUTE**
- **LOW COST MAINTENANCE**



MODERN ENGRAVING & MACHINE CO.

1413 CHESTNUT AVE. HILLSIDE 5, NEW JERSEY

Hardwood Pulping Discussed at Forest Products Lab.

▶▶▶ MAJOR PROBLEMS in the production of hardwood pulp were outlined in a symposium at the Forest Products Laboratory, Madison, Wis., held May 16 by the American Paper and Pulp Association's Committee on Co-ordination of Research. Attended by nearly 50 technologists from about 25 mills throughout the country, this conference focused attention on furthering the utilization of species of wood formerly considered worthless by pulp manufacturers.

The conference was opened by George M. Hunt, director of the Forest Products Laboratory, E. W. Tinker, executive secretary of APPA and W. E. Byron Baker, director of research for the New York and Pennsylvania Co., Lock Haven, Pa., chairman of the committee.

Present status of various phases of hardwood pulping was outlined and reviewed by members of the Laboratory staff under leadership of G. H. Chidester, chief of the Pulp and Paper Division. The symposium took the following form with papers presented on the subjects listed. All speakers on the program were from the Laboratory staff except F. W. O'Neil, who is on the teaching staff of the New York State College of Forestry at Syracuse University.

Hardwood structure	B. F. Kukachka
Barking hardwood	E. W. Forbes
Pulping hardwood:	
Groundwood	A. Hyttinen
Chemigroundwood	F. W. O'Neil
Semichemical	J. N. McGovern
Sulphate	J. S. Martin
Bleaching hardwood pulps	F. A. Simmonds
Papermaking	G. E. Mackin

One of the highlights of the program was the announcement of a new hardwood pulping process developed at the Laboratory by J. N. McGovern and K. J. Brown. This process, which has successfully undergone commercial tests at the Green Bay Paper and Pulp Co., consists essentially of treating wood chips with caustic soda and then running the softened chips through a refiner for defibering. Up to 95 per cent yields were reported for this process, which eliminates the need for pressure cooking. In the tests made at Green Bay, Aspen was pulped by the new process and the pulp made into paperboard for use in the manufacture of boxes and containers. A more extensive trial run is now being planned.

Kimberly-Clark Continues Research Fellowship Study Grants

Grants for research fellowships at the University of Wisconsin, Massachusetts Institute of Technology, Notre Dame, and Purdue University, have been renewed by Kimberly-Clark Corp., Neenah, Wis., and for the first time the University of Minnesota is included.

The purpose of this fellowship program, first instituted by Kimberly-Clark in 1946, is to implement graduate level studies in subjects valuable to the pulp and paper industry; physics, chemical engineering, economics, organic chemistry and forestry are among the fields of work included. Selection of students, and their specific subjects of study, is controlled by the individual schools, while donors designate the general fields of work.

Most of the grants are for doctorate work. Kimberly-Clark permits the publication of the results and findings of the studies, which are published and made generally available as the schools individually determine.

A three-man committee administers the Kimberly-Clark fellowship program. H. A. Rothchild, corporation technical director, serves as chairman; R. W. Lyons, assistant vice president and woodlands manager, and W. H. Swanson, manufacturing director, complete the committee.

THE SIXTH ANNUAL meeting of Trees for Tomorrow, Inc., was held in Merrill, Wis., April 26. All officers were re-elected and J. M. Conway, president Hoberg Paper Mills (Green Bay, Wis.) and Robert Diehm, vice president Ward Paper Co., Merrill, were named as members of the board. Folke Becker, president of Rhinelander Paper Co., is president of the group.

AN AGREEMENT covering 15,000 pulp and paper workers has been signed by the representatives of eleven Ontario pulp and paper companies. A joint statement by the companies and eight unions said the agreement provides for an hourly wage increase of five cents, three weeks' vacation after 15 years service, and a three-cent an hour night differential. The basic wage rate was not announced.

Palatka to Expand— Double Capacity

An announcement that the Hudson Pulp and Paper Corp. will build a $10,000,000 expansion to its plant at Palatka, Florida, was released May 13 by Gov. Fuller Warren, of the state of Florida.

The Governor, who is a director of the corporation, stated that work on the addition will be started at once, bringing to completion several months of negotiations between him and William Mazer, executive vice president of the Hudson company. First plans indicated a planned expansion of around $8,000,000, but later the amount was increased to $10,000,000.

It was indicated by the announcement that the capacity of the plant would be doubled; that employment would be increased 750 persons; and

Strathmorean Award Winners . . . .

The five best essays in Strathmore Paper Co.'s Quality Essay Contest won for each of these employees a $100 U. S. Savings Bond. George E. Williamson (left), company president, is shown making the awards to: Catherine P. Mandirol, Finishing Room, West Springfield Mills; W. Alfred McGilpin, Sales Correspondence Department, West Springfield, Bemis P. Wood, Superintendent's Office, West Springfield; Aloysius J. Cook, Stockhouse, West Springfield; and Charles E. Benoit, Superintendent's Office, Woronoco No. 1 Mill. The contest was open to all company employees with the exception of the Management Group.

the annual payroll would be increased from $2,000,000 to $4,000,000.

The Palatka mill is located on the St. Johns River on a site of approximately 500 acres. The company owns approximately 27,000 acres of woodlands in Florida and holds cutting rights on about 61,500 cords of pulpwood in Florida and Maine.

The Palatka plant, completed late in 1947, is an integrated kraft mill manufacturing sulphate pulp, kraft paper, and converting the paper into bags and gummed tape. Last year the mill produced approximately 63,000 tons of kraft paper.

The company also has plants in Augusta, Maine, Bellows Falls, Vt., and Lansdowne, Pa.

Tree Farm Certificate Awarded Union Bag

In recognition of the approved management it is giving 53,770 acres of company-owned land in South Carolina, Union Bag and Paper Corp., New York, was recently awarded a tree farm certificate by the South Carolina State Commission of Forestry and Clemson College Extension Service.

The presentation was made Mar. 24 by C. H. Flory, South Carolina state forester, and John Witherspoon, assistant forester and public relations chief of the Forestry Commission, to T. T. Dunn, vice president and resident manager of the Savannah plant, and G. W. E. Nicholson, company vice president in charge of manufacture, who accepted the award for the company.

Union Bag was awarded a similar award last year by the Georgia State Commission of Forestry and the Georgia Forestry Association for work done on company forests in Georgia.

HEADQUARTERS OF Robert Nivison, vice president and manager of mills for Hollingsworth & Whitney Co., will be transferred from Waterville, Me., to company executive offices in Boston, Sept. 1. With headquarters at Waterville, Thomas M. Barry will be promoted from assistant manager to manager of the Northern mills, effective Aug. 1.

Lowell Textile Institute Summer Paper Course Held This Month

The Department of Paper Engineering, Lowell Textile Institute, Lowell, Mass., has announced a summer course in "Paper—its Properties and Uses," sponsored by the Boston Trade Paper Association. The course, which was held in Lowell from June 5 through June 16, included studies on the properties of paper, paper testing, manufacture of specialty papers, letterpress printing, offset printing, etc. In conjunction with the lectures, plant visits were made to paper mills, converting mills, and printing plants.

CONSTRUCTION OF A NEW $14,000,000 pulp and paper mill near the eastern city limits of Edmonton, Alberta, should begin early this summer, according to a recent announcement made by R. O. Sweezey, president of the Edmonton Pulp and Paper Mills Ltd. (Cf. P. I., Feb., 1950)

Downington Paper Co. Gives Noble & Wood Large Equipment Order

A contract for twenty beater and machine chests has been awarded to The Noble & Wood Machine Co., Hoosick Falls, N. Y., by Downington Paper Co., Downington, Pa.

The new chests, equipped with the latest type of propeller agitators, will be constructed of Chemtile and will be installed with individual motors and drives for each propeller agitator. Fourteen of the chests will have vertical agitation; six will be horizontally agitated.

Construction on the new installations, which will serve all of the three paper machines at the Downington mill, will start immediately and will be planned in stages which will cause no interruption to the present production schedule.

Rewarded for Good Forestry . . . .

For good management of its forest lands in South Carolina, Union Bag and Paper Corp. (Savannah, Ga.), received a tree farm certificate from the Gamecock State. Left to right: C. H. Flory, South Carolina state forester; John Witherspoon, assistant forester, and public relations man for South Carolina State Forestry Commission; G. W. E. Nicholson, vice president of Union Bag; W. J. Barker, extension forester of Clemson College, and T. T. Dunn, Union Bag vice president and resident manager of Savannah operations.

Montgomery Heads New Dept. at United Board

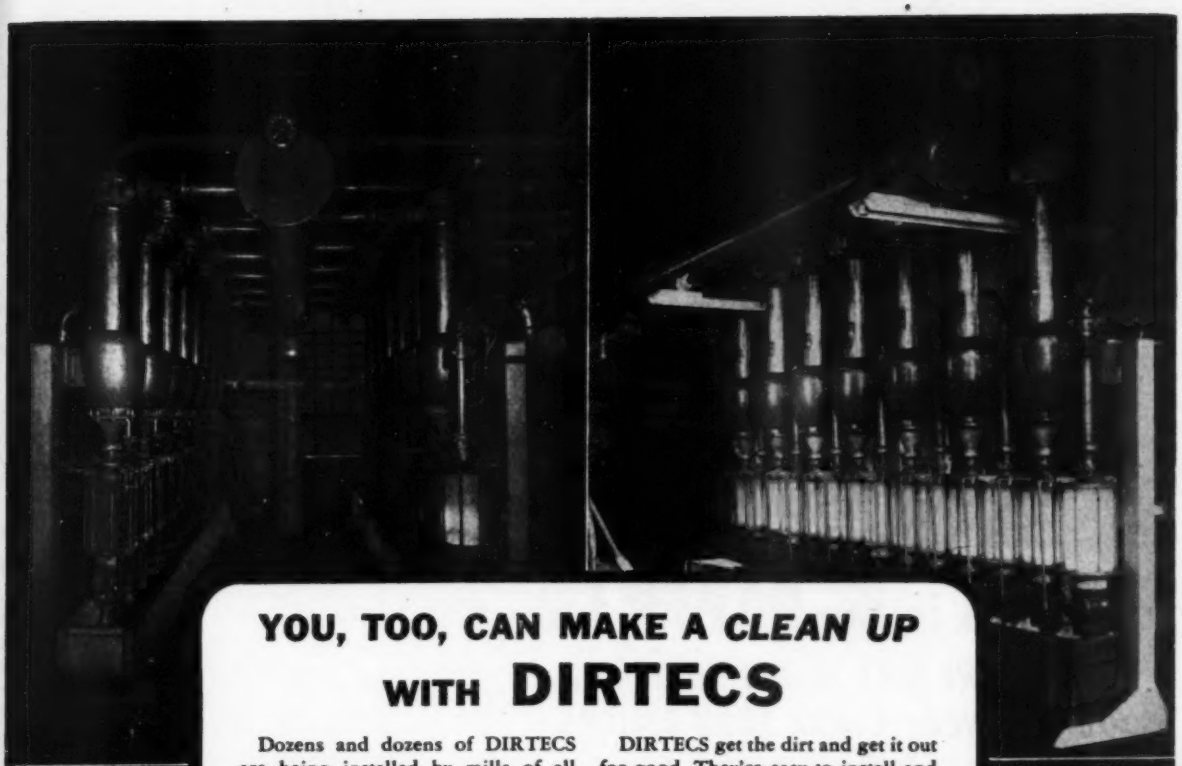
The newly-created production control department of United Board and Carton Corp., Syracuse, N.Y., has as its head Arthur Montgomery, formerly chief estimator of the firm.

The new department has been set up to insure uniform quality production throughout each of the company's five carton plants, by relaying information of new innovations or improvements in production technique promptly to each plant.

A NEW POWER PLANT scheduled to begin operations in September is under construction at the Thompson, N.Y. paperboard plant of United Board and Carton Corp., Syracuse, N.Y. The new plant will increase production of paperboard to meet expanding sales of cartons.

A THREE-DAY SALES conference held by Certain-teed Products at the company's manufacturing plant at Niagara Falls, N.Y., May 15-17 was attended by more than 50 company salesmen. Certain-teed President Rawson G. Lizars addressed the group at a dinner May 17, climaxing the conference.

A NEW AND MODERN bleach plant is under construction by Dexter Sulphite Pulp and Paper Co., Watertown, N.Y. Estimated at a cost of $150,000, the new plant is located in an old building adjacent to the mill's offices, but the structure is being entirely rebuilt with entirely new machinery.



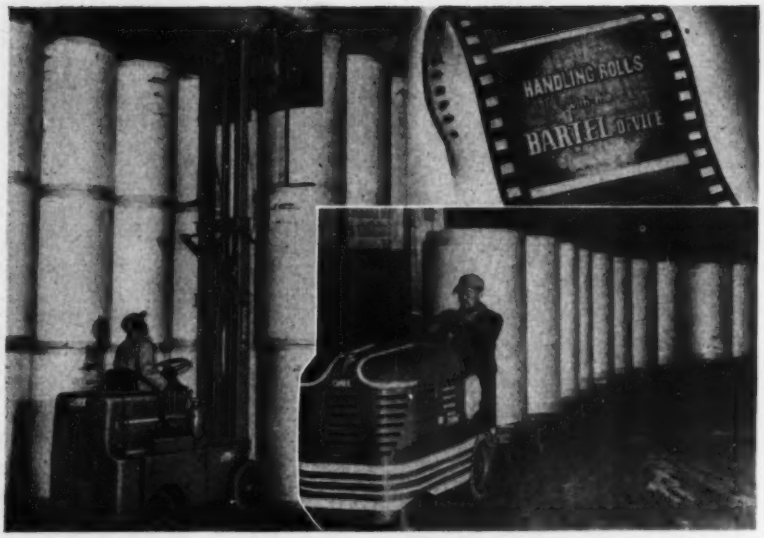
YOU, TOO, CAN MAKE A *CLEAN UP* WITH DIRTECS

Dozens and dozens of DIRTECS are being installed by mills of all kinds and sizes, right now. Why? Because DIRTECS provide quick, sure, inexpensive protection against competition from cleaner paper in today's choosy market.

DIRTECS get the dirt and get it out for good. They're easy to install and operate — readily adaptable to *your* dirt problem, *your* stock, *your* volume requirements.

Ask us for recommendations and estimates.

BIRD MACHINE COMPANY
South Walpole, Massachusetts



CLARK in the PAPER Industry

A SURE-FIRE WAY TO GET MORE FOR YOUR MONEY—CLARK FORK TRUCKS

✓More Efficiency
(DO MORE JOBS BETTER)

✓More Economy
(COST LESS TO OPERATE)

✓More Durability
(LAST LONGER)

CLARK products are released only after standing the exacting test of Clark's Unmatched Engineering Laboratory.

Lower your break-even point—by cutting those handling costs with the versatile, efficient, and economical Clark Machines

Many practical handling attachments broaden the usefulness of Clark fork trucks—good idea to know about them

To borrow the new movie—"Handling Rolls with the Bartel Device" fill in coupon, attach it to your business letterhead and mail to CLARK

THREE MORE REASONS WHY CLARK IS YOUR BEST BUY

CLARK ELECTRIC AND GAS POWERED FORK TRUCKS AND INDUSTRIAL TOWING TRACTORS

INDUSTRIAL TRUCK DIVISION • CLARK EQUIPMENT COMPANY • BATTLE CREEK 22, MICH.

We would like to make arrangements to borrow the movie "Handling Rolls with the Bartel Device."

NAME_____

FIRM NAME_____

STREET_____

CITY_____ ZONE____ STATE_____

AUTHORIZED CLARK INDUSTRIAL TRUCK PARTS AND SERVICE STATIONS IN STRATEGIC LOCATIONS

Mead Corporation Sponsors Tree Planting Through Michigan Mills

A tree planting project sponsored by the Woodlands Department of Mead Corp. through its Michigan Division mills at Manistique and Escanaba, Mich., will soon be started on land owned by the corporation near Thompson, Mich.

Two types of mechanical planting machines will be tested in planting Norway Pine, and White and Norway Spruce transplant stock. To begin as soon as weather permits, the project is a forerunner of planting scheduled when the Michigan Department of Conservation undertakes direction of a local nursery in a similar program.

A PANELYTE DIVISION has been formed by the Canadian subsidiary of St. Regis Co., to be located in a new plant at St. John's, Que. Expected to go into production by late fall, the new plant will supply the requirements of the Canadian market for refrigeration, industrial, and decorative Panelyte, the firm's trade name for laminated plastics.

AT THE ANNUAL QUARTER Century Club dinner held recently by the Union Bag and Paper Corp., New York, three members of the company's administrative personnel were awarded 25 year service pins by company President Alexander Calder. Membership in Union's Quarter Century Club is now 153.

PRODUCTION HAS BEGUN at the Columbian Paper Co. mill at Buena Vista, Va., leased by Piedmont Paper Co. Norman A. Liebreich is vice president and general manager of the company, which will manufacture kraft and kraft specialties.

A DEMONSTRATION sponsored by Union Bag and Paper Corp., members of the Southern Pulpwood Conservation Association and P. D. Breckenridge of Columbus, Ga., was held late in April near Cuthbert, Ga., to show proper cutting practices on timberland to many interested observers.

PLANT IMPROVEMENTS and modernization planned for Powell River Co., Ltd., Powell River, B. C., will cost $3,500,000. The new improvements will make possible an additional 51,000 tons produced each year, so that in 1952 output of newsprint should be 101,000 tons above 1947, when 239,000 tons were produced.

All roads lead to Hamilton, Ohio

Once upon a time "all roads led to Rome" for there was centered all responsibility for the government of The Roman Empire.

Today, in the better judgment of many a paper maker, all roads lead to Hamilton, Ohio, where "everything for the paper mill" can be obtained through The Black-Clawson organization.

It pays to center the purchase of paper mill equipment at one point:

- Greater assurance of smooth and perfect operation of every machine in the entire mill.
- Just one company to hold responsible for anything that may not operate perfectly —no opportunity for one supplier to lay blame on another for performance failures.
- Better coordinated delivery schedule—equipment arriving in the order erection crews want it to arrive.

As you plan that new mill or the modernization of that older mill, keep the above in mind. See that "all roads" lead to Hamilton and benefit accordingly.

EVERYTHING FOR THE PAPER MILL

THE BLACK-CLAWSON CO., Hamilton, Ohio

Divisions: SHARTLE BROS. MACHINE CO., MIDDLETOWN, OHIO • DILTS MACHINE WORKS, FULTON, NEW YORK

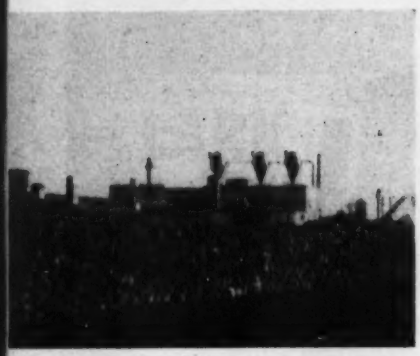
B-C International, Ltd., 16 Catherine Place, Victoria, London S.W. 1, England

FLAX SHIVES are converted to . . . . . .

BUILDING BOARD for many types of construction

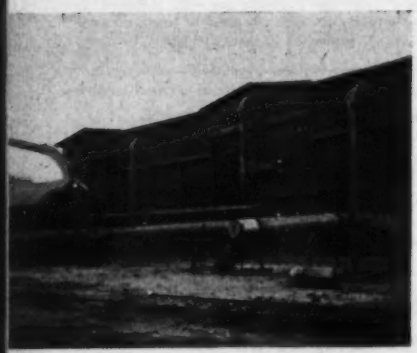
Modernization at Maizewood's Insulating-Board Mill

RICHARD W. PORTER
Editorial Director, The Paper Industry



Local wood aids raw material supply

Straw (left) and hemp hurds are used



Flax storage sheds hold 55 carloads

▶▶▶ LOCATED near the Mississippi River at Dubuque, Iowa, the Maizewood Insulation Co. manufacturers a wide variety of building boards from an equally wide variety of raw materials, abundant in this area. Built in 1929 to make insulating board from cornstalks, its processes have been broadened to utilize practically any type of available fibrous material including straw, flax shives, hemp, wood and wastepaper.

The mill was first designed to employ processes developed at Iowa State College. However, it was partially destroyed by fire in 1932 and although it was rebuilt and resumed operation, the company soon found itself in financial difficulties. Because of this, in 1935, the late H. A. Hauptli interested a group of business men in refinancing the company and took over the management and operation of the mill. Having had nearly 25 years previous experience in designing, building, and operating paper mills (mainly for Sears Roebuck & Co.), Mr. Hauptli was able to guide this mill towards a more successful operating basis.

Record of Progress

Since that time (with the exception of the war years) a program of improvement has been carried out almost constantly. Some of the high points of this program are:

1937—Installed Appleton Machine Co. Vortex beater

1937—Built new laboratory and machine shop

1938—Installed new Claflin refiner and new Noble & Wood jordan

1938—Replaced the original forming machine with a new 108-inch wide Shartle fourdrinier

1938—Installed an asphalt coating machine

1939—Dug new 1300-ft. deep fresh water wells

1940—Installed spray coater and 60-ft. electric radiant heat dryer

1946—Installed second Appleton Vortex beater

1946—Replaced old presses with new Black-Clawson press section consisting of four sets of pneumatically loaded plain monel covered rolls

1946—Built two new concrete stock chests

1948—Added 50 per cent more drying capacity to the existing Coe dryers

1948—Installed new Sprout Waldron refiner

1948—Built two additional concrete stock chests

1948—Installed wood handling facilities; unloading dock, 84-inch chipper, screens, conveyors, etc.

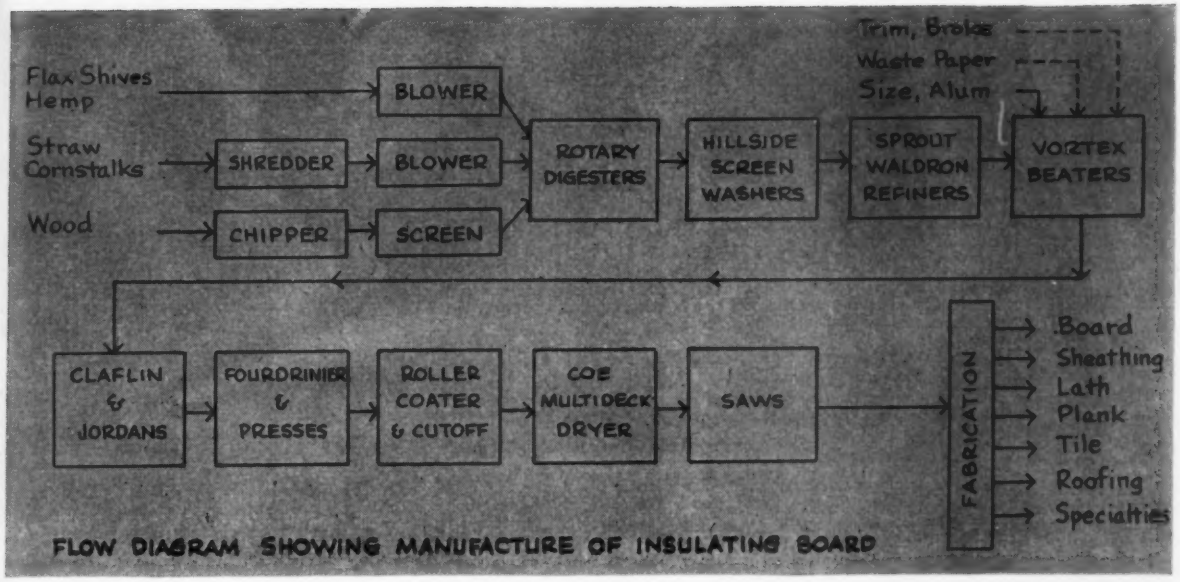
1948—Installed new electrical distribution system

1948—Developed and built wallboard packaging machine

1949—Installed two additional Sprout Waldron refiners

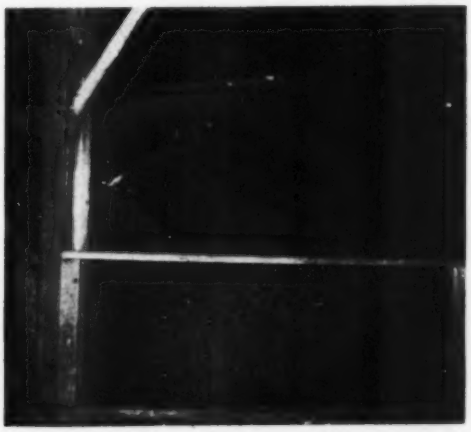
1949—Installed roll coater on board machine

1949—Installed equipment for mixing paint used in coating

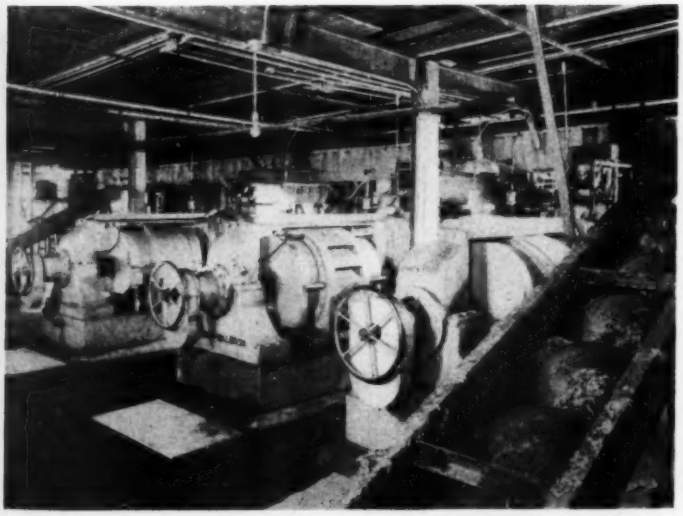


FLOW DIAGRAM SHOWING MANUFACTURE OF INSULATING BOARD

1—Suction and blower system transfers flax to cyclones which discharge direct to the digesters



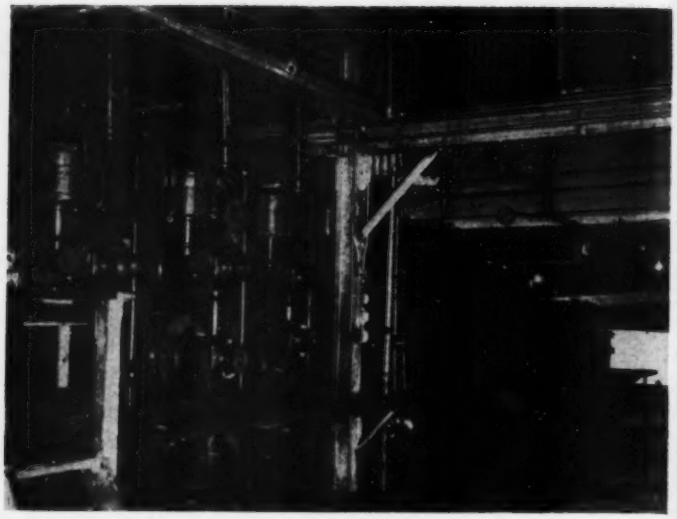
2—Flax and wood chips are cooked together in rotary digesters



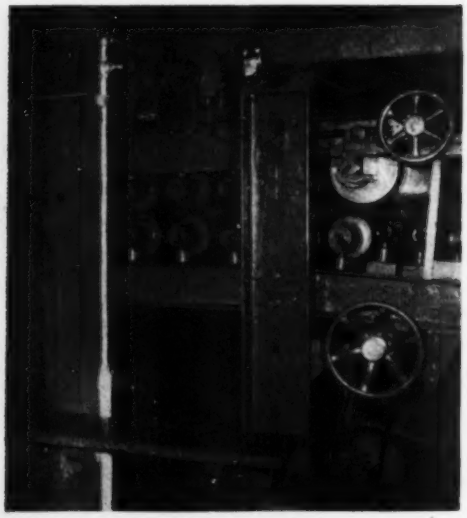
3—Screw conveyors feed mixed wood and flax semichemical pulp to the Sprout Waldron refiners

4—Size and alum are added at the Appleton Machine Co. Vortex beaters

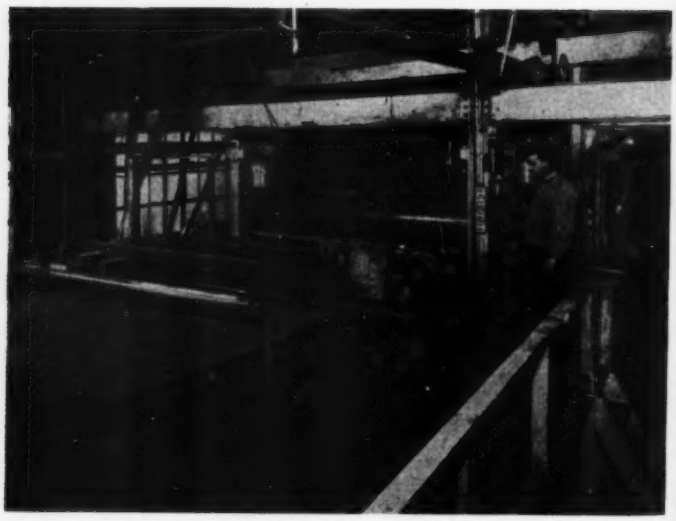
5—Claflin refiner (left) and Noble and Wood jordans refine the stock



6—Board is formed on the Shartle fourdrinier (right) and water is extracted by a Black-Clawson press section



7—Couch section of Shartle fourdrinier



8—Board is coated and cut into lengths before entering dryer

9—Back of Coe multideck hot-air dryer

10—Sheets of board leaving dryer

1950—Built new warehouse

In 1935, the mill was capable of producing about 40,000 pounds per 24-hour day of insulation board. Now, with about 130 employees, its production capacity is about 120,000 pounds per day, and the variety of products includes insulating lath, plain and coated wallboard, plank tile, asphalt coated sheathing and numerous specialties.

Upon his death in 1945, Mr. Hauptli's son, Robert W. Hauptli, was made president and general manager of the company. Another son, John H. Hauptli, is vice president in charge of sales. Other officers of the company are: Miss Zenith Mary Ellis, vice president and treasurer; W. M. Tschirgi, secretary and purchasing agent; and W. Benschneider, general superintendent, all veterans at Maizewood. Mr. Benschneider has been with the company since it first started operation in 1929. The years of experience and youthful vigor of its executives combine to make the Maizewood Insulation Co. one of Dubuque's most progressive industries.

Automatic packaging machine built by Mast Development Co. wraps over 100 bundles of building board per hour

John H. Hauptli, vice pres., Robert W. Hauptli, pres., and W. Benschneider, gen. supt. of Maizewood Insulation Co.

Wm. Tschirgi, sec'y & purch. agt., and Miss Zenith Mary Ellis, vice pres. and treas.

Raw Materials

Flax shives are brought in by railroad car. The storage shed, with a capacity of about 55 cars of flax shives, provides sufficient storage so that if the supply is interrupted there is plenty of time to obtain sufficient quantities of other raw materials. The flax storage bin is equipped with recording thermometers with bulbs located in various spots to indicate and record the temperature. This helps prevent loss by overheating and fire.

Railroad tracks are laid out so that four cars can be unloaded at once. Actually, it is possible with a minimum of shifting to handle some dozen cars. Pneumatic conveyors suck the shives from the cars and blow them to storage or to any one of the three cyclones located above the digesters.

Wood is obtained from local farmers and woodlot owners. Practically any type of wood that grows along the river is used. Wood may be unloaded to the receiving dock direct from the truck or it may be unloaded in the yard where approximately 1,500 cords are stored. Wood from yard storage is transferred to the receiving dock by means of a special cradle device on a tractor. This operates something like a fork lift only it has arms over the top and the whole cradle can be rotated upward to dump the load.

A single, 84-inch chipper is employed to handle the wood and the chips are screened and then sent direct by belt conveyors to the digesters. No chip storage is provided. The wood mill operates only during the feeding of the digesters.

Straw and cornstalks, when used, are unloaded direct from trucks onto a conveyor which feeds a shredder. The shredded material is then blown direct to the digesters. At the present time, flax shives and wood are the major raw materials employed.

Semichemical Pulping

Both flax and wood chips are cooked together in three 14-foot globe rotary digesters. They operate on a four-hour cooking cycle, but the actual cooking time is about one hour at 80 psi. Neutral sulphite liquor is used to cook the semichemical pulp. A 75 per cent yield is achieved.

When ready to be loaded, about 200 lb. of sodium sulphite and 50 lb. of caustic soda are dumped into the digester. Hot water is then added and the flax and wood charged to the digester. In contrast to many straw pulp operations, the digester operates under a single fill system where it is completely charged in a single operation. After cooking, the pressure is released and the blow steam is passed through a heat exchanger to heat water for a succeeding digester charge. Then the cover is taken off the digester and it is dumped into a pit.

The semichemical pulp is slushed with wash water and pumped over a hillside screen, where it is dewatered before it drops into a chest. From the chest it is pumped to a screw conveyor which feeds the three Sprout-Waldron refiners. The refiners defiber the semichemical wood chips and the flax shives into a more or less homogenous pulp. They discharge direct by gravity to a storage chest from which the pulp is pumped to a Vortex beater where size and alum and other materials are added. A second Vortex beater is used to pulp up broke and waste board from the insulating board finishing operations. Wastepaper may be added at this point, when desirable.

The Vortex beaters discharge to a chest, from which the stock is pumped in series through a Claflin refiner and three Noble & Wood jordans. This stock discharges direct to the fan pump where it is mixed with white water and then pumped to the machine headbox.

Forming Machine

The Shartle fourdrinier forming machine has a 112 inch x 56 foot, 12-mesh wire. The wire runs up hill to the couch roll. From the couch roll the insulating board goes through the press section containing four sets of Monel covered plain press rolls. The press rolls are air-loaded and controlled by a Mason-Neilan panel.

Upon leaving the press section the board is coated with a roll coater before it is cut into sheets by a cut-off machine. These sheets then go on live conveyors into the drying chamber. These conveyors are mounted on a pivoted section which automatically sends the sheet of board to any one of the 8 horizontal decks of the Coe dryer. As the insulating board comes from the drying chamber it trims 100 inches wide. It is then sawed into the desired sizes after which it is packaged for shipping or is transferred to the various fabricating machines.

New Board Packaging Machine

One of the most interesting installations at Maizewood is a new machine that automatically packages bundles of six to eight sheets of insulating wallboard as large as 4 x 10 feet, wrapping and sealing them in 90-lb. kraft paper with reinforcing strips. Use of the machine, which will wrap over 100 bundles of board per hour, has lowered packaging costs by reducing manpower saving wrapping paper, etc.

The new automatic wrapping machine, developed and manufactured by the Mast Development Co., Inc., Davenport, Iowa, operates as follows: Sheets of board are lifted manually from pallets to a cross-feed conveyor, which when started carries the boards onto the in-feed conveyor, pushing the boards into alignment. At the same time, the wrapping paper is measured to the proper length and the crosswise reinforcing strips are fed into place. Then the bundle of boards on the in-feed conveyor is moved into the vertical web of wrapping paper and the edges are folded, glued and trimmed. The partly wrapped bundle is run onto the out-feed conveyor, while the in-feed conveyor, carrying a glue dispenser, glues the end of the package as it returns to its starting position. The out-feed conveyor carries the package between two heated pressing rails to insure tight sealing before discharging the completely packaged bundle.

Pension Plans—Your Problems

WILLIAM J. CASEY
The Research Institute of America, Inc.

▶▶▶ THE MOVEMENT FOR PENSIONS is entering the second round in 1950. Every company, whether large or small, union or non-union, financially stable or otherwise, must anticipate the problems involved. Organized labor has succeeded in its drive for pensions, even though there is doubt as to the meaning and cost of pension agreements negotiated last year. Pressure for benefits will manifest itself in at least two directions: either to force pension plans on more companies, or to compel companies with pension plans to increase benefits. Many difficulties must be faced in reaching any agreement, as can be seen by past settlements.

Pension plans are perfect examples of long range planning. Companies setting up such programs are estimating what they will spend ten, twenty, or maybe even fifty years from now. They must take into consideration the death rate of employees, both employed and retired, the probable interest on investments in years to come, wage raises in the future, earning prospects and above all the record in number of employees to be hired, and the turnover rate. All these items must be carefully weighed before a pension plan can be considered.

Before speaking for or against pensions, a company must investigate the possibilities therein and find out if it can afford such a plan. It must decide if it will pay a definite pension or whether it will make contributions to a fund.

Therefore, the main problem facing industry is, what will it cost? After all the points mentioned above are taken into consideration, only a rough estimate is possible. Many actuaries feel that the cost of agreements being reached will far exceed the money being set aside. However, again the company must consider costs of providing benefits after installation of the plan and costs before it starts.

Next to raising the retirement age, these points are pertinent to lowering cost: (1) contributions by employees as an investment, (2) restricting eligibility by tightening up on age and service restrictions, (3) deduction from federal income tax of employer's contribution, and (4) discounts and savings from employee turnover and mortality.

In deciding on a scale of pension benefits, there are two main factors: (1) adequate retirement income for employees, and (2) what the company can afford. A pension, plus social security and any other income, should permit an employee to maintain a retirement standard of living somewhat commensurate with his working income and grade of employment.

The pension might very well reflect two things: the earnings of the employee and his contribution to the company, that is, the length of his service and its value. To achieve this, a scale of benefits is determined in one of the following ways:

(1) The employer (and employee, if the plan is contributory) contributes a stated percentage of pay each year. The pension then will be whatever amount the funds so accumulated will purchase at retirement.

(2) During each year of service a participant earns an annual retirement benefit of one per cent or more of his average or final earnings.

(3) If an employee completes a stipulated period of service, his pension would be a specified percentage of his average or final pay.

(4) A flat amount for each year of service would be set aside regardless of salary, provided a minimum service period is completed.

Social Security

Where the amount of a pension is set either in terms of service or earning, or by a flat amount, it may be integrated with social security benefits. Some companies provide that these benefits are to be deducted from the retirement amount used to fix the pension to be provided by the company's plan. Where a plan promises only the pension benefits that can be bought by the accumulated funds, the agreement can specify that company contributions will be decreased as social security benefits or taxes are increased. Funds released from company pension commitments by social security changes will be used in maintaining the company's competitive position.

Eligibility Factors

One of the important purposes of the pension plan is to effect a reduction in turnover. Here are some eligibility factors which may be used in constructing the pension plan:

(1) Attainment of a minimum age.

(2) completion of a specified length of service (one to five years).

(3) A combination of age and length of service requirements under which the length of service requirement for participation is reduced as the

age record of an employee is increased.

(4) Reduce the amount of benefits earned by past service of employees near the retirement age thus lowering the scale of pension benefits for employees who reach retirement age before the company has had an opportunity to build up an adequate fund.

(5) Restrict participation to office employees paid on a weekly basis rather than those paid at an hourly or commission rate.

(6) Exclude employees earning less than a minimum annual income.

In deciding eligibility, draw up a list of withdrawals over the past several years, by length of service and by age. Check the pattern to see where the bulk of withdrawals exists, from an age as well as service standpoint.

Retirement Age

Retirement age of 65 is probably influenced by the fact that social security payments began then, but a higher age can be set for the purpose of reducing costs. Hazardous character of work or special unsuitability of employees of advanced age is the reason behind the earlier age retirement. It may be wiser in many situations to leave the retirement age up to the worker if his capacity is up to par, and it may be advisable to consider a discretionary retirement age plus provisions that will give some degree of flexibility. Upon early retirement, benefits may be restricted to the value of pension credits earned to the date of retirement. On the other hand, the employer may ask the employee to continue work as long as he is willing with an incentive being the earning of additional pension credits.

Death Benefits

When considering a pension program employers should bear in mind that death benefits are a more common need than retirement benefits, and the cost of providing these benefits, as a separate item, is far less than retirement. When combined with a retirement program, a two-fold problem is presented:

(1) How much of a death benefit should be paid before retirement, and (2) what is a desirable amount after a worker has retired. In the first situation the amount is usually about one year's wages—seldom continued after retirement. Death benefits after retirement are seldom much more than is enough for final medical and burial expense.

Disability Pensions

Disability cannot be predicted accurately. The existence of such a feature in the program tends to increase the incidence of disability as both employees and, to some extent, management lose incentive to carry on and to discover useful areas of activity. The most economical way to handle permanent disability may be on a case-by-case basis (1) the same program for disability coverage as for the pension plan may be used, but it is desirable to create separate reserves and cost records, (2) any declaration of policy should be avoided, unless bargaining pressure demands written promises, (3) minimum terms of age, length of service or both should be set before payment of disability benefits, and (4) each case should be checked thoroughly to prevent unjustified claims.

Financing Your Plan

The money to pay pensions will come from a fund built up by the annual contributions of employer or both employee and employer, or from the current operating revenue of the company. Recently unions have emphasized pay-as-you-go or unfunded plans in an effort to minimize cost, establish the principle of employer-pay-all and get the largest possible scale of benefits. These plans can be deceptive, and in depression years, when the number of pensioners is increased, may mean ultimate discontinuance.

Funded plans can be much less expensive because they permit company contributions to be augmented by employee contributions, by interest and by tax savings unavailable in a pay-as-you-go plan. A pension plan can be funded by depositing funds in trust under the administration of the company and/or trustees, or by buying appropriate contracts from an insurance company.

Most pension plans for small companies of ordinary financial strength are operated by the purchase of a standard retirement annuity or retirement income policy for each employee. If the number of employees to be covered is 100 or more, the insurance company contract most often used is a group annuity. Small paid up annuity units are purchased each year as a credit for the current year of service. Annuity credits for years before the inception of the pension plan are usually purchased by the employer over a period of years. After prior service credits are completely purchased there exists a fully funded plan under which all pension promises are supported by insurance company guarantees. If employer annuities are not vested in employees, a return is made to the employer when an employee terminates service.

Investing for Pensions

Investment of trust funds in most states has to follow rigid rules unless the trust agreement itself provides differently. Otherwise, you have to stay within an "approved list" and forego possible chances for a better yield in many propositions where the safety margin may be just as great. Avoid this by specific language that empowers the trustees to invest wholly at their own best discretion, and in any desirable investment, including common stocks. Advisability of putting a portion of the pension reserve in a company's stock cannot be generalized. It is possible that crucial blocks of the company's securities in the funds' hands could perpetuate an inefficient management, or, if through stock ownership the fund depends for some of its earnings upon profits, the pension system can become a significant part of a firm's production incentive program.

Before getting approval to invest in stock or securities issued by the employer, the trustee of a qualified plan must give the Treasury a detailed analysis of the employer's financial record for the past 5 years and the extent of self-investment contemplated.

Insurance Contracts

Plans which employ insurance contracts as their funding media are relieved of practically all investment problems automatically. For investment purposes, insurance companies merge pension receipts with general assets. As investment vehicles, insurance companies net earnings rates for the past few years have been just under 3 per cent. Direct assumption of commercial loans often means very high underwriting and marketing savings.

Negotiating Pointers

A sound pension plan is an intricate and delicate social mechanism. If you must bargain on pensions, don't buy patterns. Study facts and work out your own policy on these points:

(1) Do your employees need or want a pension program?

(2) What can you afford?

(3) What kind of union pressure will you face?

(4) In light of union attitude and company realities, formulate a definite position.

(5) Try to avoid any definite commitments before the social security picture is settled.

(6) Don't place too much reliance on a clause that pensions will not be reopened, say, for five years.

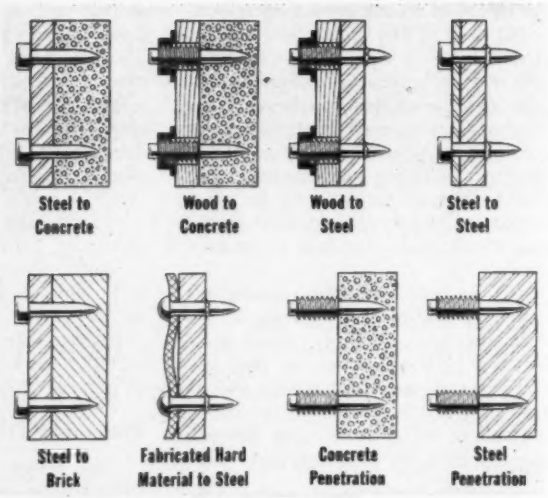
(7) Keep away from cents-per-hour talk.

(8) Weigh the cost of extras and the cost of vesting ownership of funds in employees very carefully.

(9) Investigate the savings that may come from employee contributions.

(10) Keep some control over who should retire and when.

Powder-actuated tool for seating studs
(Courtesy Stemco Corp.)



Many types of applications can be handled
(Courtesy Stemco Corp.)

Conveyor being anchored to warehouse floor
(Courtesy Powder-Power Tool Corp.)

Pipe hangers installed in concrete beam
(Courtesy Mine Safety Appliances Co.)

Power Tool Drives Studs and Anchor Bolts

Explosive actuated driving tool shoots studs and fasteners into concrete, steel, and masonry. Aids construction and maintenance. Particularly useful in hard-to-reach places.

▸▸▸ INDUSTRIAL ADVANCES are usually stimulated by war, and World War II was no exception. One such advance was the development of powder-actuated hand tools for seating studs and fasteners into metal, concrete, and masonry. When compared with the ordinary methods of installing anchor bolts or studs into concrete, or to drilling bolt holes into steel, the powder-driven stud has many advantages.

Already such tools are used for a wide variety of purposes in maintenance and construction work in places where hand-operated, power-actuated tools such as air or electric drills ordinarily are employed. They not only provide a quick, effective method for driving studs and anchor bolts into various materials, but are being widely used to *nail* steel to concrete, wood to steel, etc. Wherever jobs of this nature must be handled away from shop facilities, the portable self-contained, powder-actuated tool proves useful and versatile.

This Is the Principle

Powder-actuated hand tools operate from the pressure of expanding gases directed against a pin or stud. Energy from the burning powder is confined and controlled so that it is released against the fastener when it has reached its maximum value. This supplies a tremendous surge of power which delivers an instantaneous, high velocity to the pin or stud. Basic principle that

makes the tool work is the holding back of the power stroke until full pressure is developed. One important characteristic is that combined with high power it is compact and light in weight, easy to handle, fast in operation, and entirely independent of outside sources of power. Depending on the particular size or model, these tools weigh as little as five pounds with some of the larger units weighing about ten pounds.

Three Makes of Units

Tools of this type all utilize the same essential components: (1) a powder-charge exploded by a conventional percussion type primer; (2) a projectile-like stud; (3) a barrel which guides the stud while it attains maximum velocity; and (4) an adequate mechanism for operating the unit with efficiency and safety. Three makes of units are available: the *Velocity-Power Driver,* made by Mine Safety Appliances Co., Pittsburgh (Pa.); *Drive-It,* made by Powder-Power Tool Corp., Portland (Ore.); and the *Ramset System,* made by Stemco Corp., Cleveland (Ohio).

All powder-actuated tools are operated in a similar manner. Stud and powder cartridge are inserted into the barrel. The barrel is then screwed into the firing unit proper. When the driver is positioned on the work, a safety device is operated and the whole tool pushed forward to the face of the work. Detonation of the cartridge drives the stud into place.

The *Ramset* tool, made by Stemco Corp., is available in the .22 and .38 caliber models utilizing separate studs and charges. The .38 caliber tool readily can be converted in the field to use .22 charges and fasteners. Several different powder charges are available with the strength of the charge, designated by the color of the wad in the charge, to control penetration. Studs are designed with flanged heads which hold the stud in the tool and which confine the explosion until the pressure is great enough to shear off the flange, permitting the stud to be driven into the work by the force of the explosion. For safe operation, the small Ramset Tool has a cam-type safety mechanism which requires two hands to turn the barrel from the safety position to the operating position. The large tool also incorporates a self-cocking feature and is fired by exerting steady pressure on the work surface. Both models are equipped with a safety shield and rubber insert to absorb and stop spall. Numerous fixtures used with the light duty tool enable the operator to fasten securely material which he could not otherwise fasten to steel or concrete, such as narrow "U" channel or corrugated aluminum or steel.

The *Drive-It* tool built by Powder-Power Tool Corp. also employs separate cartridges with flanged studs and is available in the .22 caliber and .38 caliber size. The larger unit can also be fitted with a conversion barrel so that the .22 caliber stud and cartridges can be used. Several sizes of charges are available which are indicated by different colored cartridge wads. The primary safety feature is an external safety ring which must be turned and the tool forced against the work before it can be fired. A deflector cone or safety muzzle is designed to catch dislodged particles. A molded rubber safety pad covered by a steel liner reduces fracture of concrete and wood surfaces. A recoil spring in the tool absorbs the shock load.

A more recent development by this company is its Model 300 which, by means of a power control device, permits varying degrees of stud penetration with a single size powder charge. This is accomplished by increasing or decreasing the volume of the combustion chamber by use of interchangeable hollow plugs or combustion tubes. To operate, the tool is pressed against the surface of the work which cocks the firing pin spring. When this is done, a turn of the handle fires the cartridge.

Differing somewhat from the above units, the Mine Safety Appliance tool, the *Velocity-Power Driver* employs a unit-package stud wherein the cartridge and stud are joined by a steel piston which is pressed into the stud and about which the cartridge is crimped. The piston, which minimizes possibility of ricochet, serves to guide the stud down the barrel and is stripped from the stud by a muzzle cap where it is held, sealing off any muzzle flash. This device aids in eliminating recoil by momentarily holding back the explosion gases. This gun utilizes both .32 and .44 caliber center fired cartridges and has interchangeable barrels. Since the spring loaded safety arm must be rotated and held in position as the tool is pushed forward, accidental discharge is virtually impossible.

Types of Studs

Innumerable sizes and types of studs and pins are available for all models to fit the requirements of a great variety of jobs. For the most part, studs fall into three classifications, namely; male threaded, female threaded, and plain headed. Holding power of the explosive driven stud is high. Tests have shown the holding power of such studs driven into concrete to be as high as 6,000 lbs. while in steel this value is almost doubled.

Many Uses

Applications of this tool for driving studs and fasteners are practically endless, both in maintenance and in new construction. Many pulp and paper mills have already used this type of tool and found that it saves time and enables difficult fastening jobs to be accomplished at substantial savings over conventional methods. For instance, one paper mill engineer reported a savings of installation time of four-to-one over other methods for installing sprinkler line hangers on steel roof trusses (*The Paper Industry and Paper World,* Feb. 1949, pages 1160-61).

There are, however, some limitations. Studs should never be fired into cast iron, high carbon or heat treated steel, thin slate, marble, glass, glazed brick or tile, terra cotta, or other brittle substances, or narrow strips of hardwood, such as oak or maple. In such operations, the materials tend to split or shatter.

Safety Is Important

Operators should be trained and experienced in the use of these tools, and only authorized workmen wearing goggles should be permitted to handle and operate them. Each job should be thoroughly appraised to determine the proper stud and cartridge most suitable. Manufacturers of these tools, naturally, provide necessary instructions to operators since efficiency and safety go hand in hand.

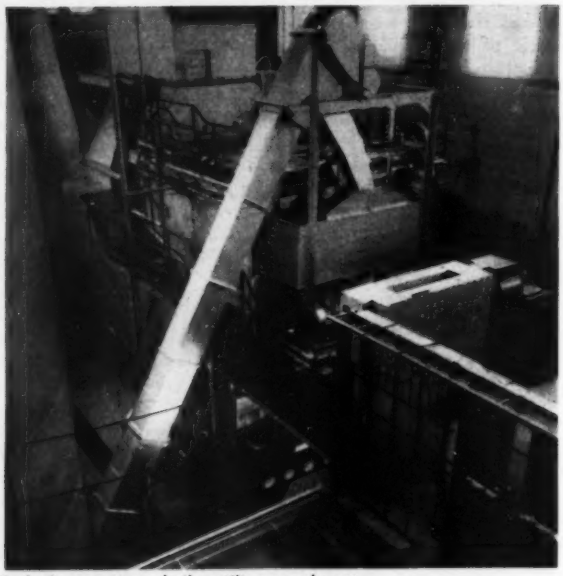
To aid in the understanding of any hazards connected with this type of work, the National Safety Council has published Industrial Data Sheet D-GEN 34, entitled "Powder-Actuated Hand Tools." Therein are discussed the various precautions and the safe practices regarding the application and operation of such tools.

The aforementioned data sheet contains the following precaution:

"The manufacturers have built safety into powder-actuated hand tools, yet any explosive device is potentially dangerous unless properly used and handled by persons who understand its principles of operation and use. Safe operation of these tools depends on adherence by the employee and employer to the many precautions listed in this data sheet. Only authorized employees should be allowed to use these tools.

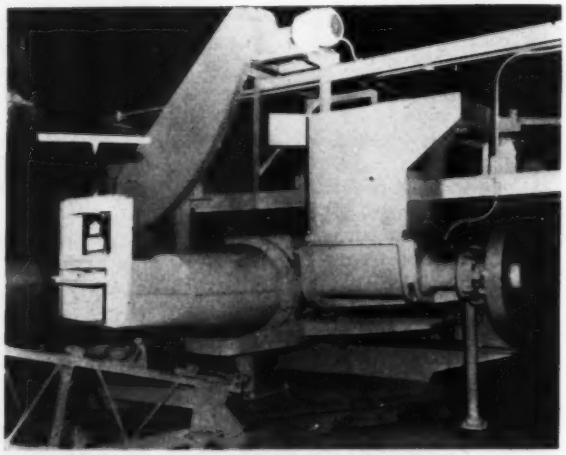
Information and illustrations for this article were supplied by individual manufacturers of explosive-actuated drivers whose help we gratefully acknowledge. A similar article entitled "Shooting Fasteners" appeared in *Fasteners,* Vol. 5, No. 4, pages 10-13, published by Industrial Fasteners Institute.

Mando's new disposal plant for woodroom refuse



Badenhausen steam boiler utilizes wood waste

Thirty-six inch diam. C. I. sluice pipe from wood room to disposal plant



One of the two American Defibrator screw presses for dewatering wood waste

Bark Utilization at Mando

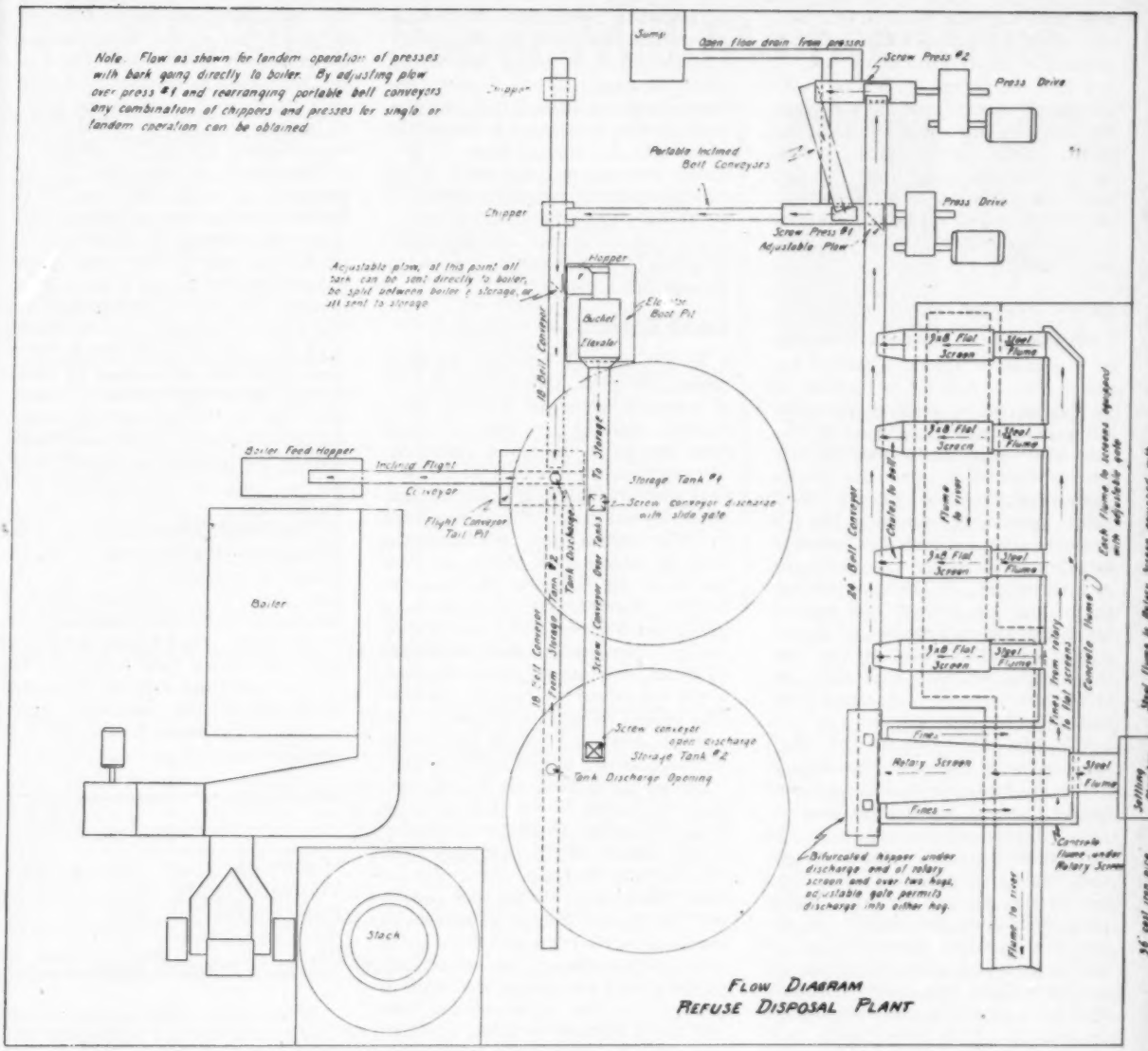
WM. C. RINDSLAND
Plant Engineer
Minnesota and Ontario Paper Co.

▸▸▸ A NEW BARK DISPOSAL plant which utilizes woodroom waste materials as fuel in a specially designed steam generator recently was put into operation at the International Falls (Minn.) mill of Minnesota and Ontario Paper Co.

Though the principal reason for building the wood refuse plant was to co-operate with conservation agencies in their program to keep the state's waterways clean for recreation and fish and game development, the new facilities are also proving an efficient and profitable method of providing steam for processing and power.

For many years, wood refuse from the International Falls mill was discharged into the Rainy River which flows between the Rainy Lake and Lake of the Woods in the border country. This method was considered objectionable, for the flowing wood refuse formed small islands that marred the beauty of the waterways and shorelines. Some of the material also adhered to vegetation along the stream. This method of disposal was replaced by burning all wood refuse in the old-type sawdust burner, and this in turn was replaced by the new waste disposal plant.

Wood waste disposal operations are centered in a large fireproof building erected between the grinder room and the pumphouse on the bank of Rainy river. The structure is of steel and brick construction, 102 ft. long, 96 ft. wide, and measuring 54 feet high at its ridge. A major part of the interior is devoted to a large steam generator and to two giant tanks in which the processed material is stored while


Note. Flow as shown for tandem operation of presses with bark going directly to boiler. By adjusting plow over press #1 and rearranging portable belt conveyors any combination of chippers and presses for single or tandem operation can be obtained.
Sump
Open floor drain from presses
Screw Press #2
Press Drive
Chipper
Portable Inclined Belt Conveyors
Chipper
Press Drive
Screw Press #1
Adjustable Plow
Hopper
Adjustable plow, at this point all bark can be sent directly to boiler, be split between boiler & storage, or all sent to storage
Elevator Boot Pit
Bucket Elevator
18' Belt Conveyor
To Storage
Boiler Feed Hopper
Inclined Flight Conveyor
Flight Conveyor Tail Pit
Storage Tank #1
Screw conveyor discharge with slide gate
Boiler
Tank Discharge
Screw Conveyor over Tanks
18' Belt Conveyor from Storage
Screw conveyor open discharge
Storage Tank #2
Tank Discharge Opening
Stack
3'x8' Flat Screen
Steel Flume
Chutes to Belt
Flume to river
24' Belt Conveyor
Each flume to screens equipped with adjustable gate
Fines from rotary to flat screens
Concrete Flume
Steel flume to Rotary Screen equipped with quick opening drop gate for diverting all flow to river in case of emergency
Fines
Rotary Screen
Settling Chamber
Concrete flume under Rotary Screen
Bifurcated hopper under discharge end of rotary screen and over two hogs, adjustable gate permits discharge into either hog.
36" cast iron pipe from Wood Room
Flume to river

FLOW DIAGRAM
REFUSE DISPOSAL PLANT

awaiting delivery to the burning unit.

Refuse from the barkers and sawdust from the slashers is sluiced to a 36-inch cast iron pipe line running from the wood room to the refuse disposal plant. Sawdust from the chip screens is blown into the sewer inlet. The pipe line discharges into what might be termed a "settling chamber" from which the refuse flows through a short open top steel flume into a rotary screen. The purpose of the settling chamber is to permit rocks, tramp iron, and other heavy debris to settle out before the effluent flows into the rotary screen.

Screens

The rotary screen has a diameter of 58 inches at the inlet end, 78 inches at the discharge end, and is 18 feet long. It is made up of perforated steel plate braced longitudinally with angle iron, and is mounted in two steel trunnion rings which rotate on four trunnions on two shafts. One shaft is chain-driven with a motor-reducer. The second shaft is chain-driven from the first shaft. To date, best dewatering without stapling has been obtained with 1 inch perforations, 1½ inch on center longitudinally and on the periphery of the screen. Experiments are still to be made to obtain greater capacity without stapling and to permit passage of larger particles of bark. Movement of the bark through the screen is accomplished by means of short pieces of angle iron set in a spiral through the length of the screen.

All refuse rejected by the rotary screen is discharged into a hog having two discs tapered toward each other with knives staggered on the surfaces of the discs. Two hogs, one of which is a stand-by, are mounted below the discharge end of the rotary screen. The hogs discharge onto a 24-inch belt conveyor over which they are mounted. The capacity of each hog is 20 tons of refuse per hour. The base for each hog and its motor is spring mounted to reduce the effect of vibration on the supporting structure.

All refuse or fines (accepted by the screen) and water, the quantity of which varies from 6,500 to 8,000 gpm, are discharged into a concrete flume in which the screen is mounted. This effluent then flows into a long, narrow concrete flume in one side of which are four vertical slide gates. The effluent is discharged through these gates onto four 3 x 8 ft. single deck screens for final dewatering. Some experimental work has had to be done to find the most efficient cloth and best results have been obtained with a 20-mesh "S" slot stainless steel wire cloth. This

wire cloth has been found to be practically self-cleaning providing a sufficient quantity of larger particles of bark, ¾ to 1 inch, are present to "ball up" with the fibrous material and carry it across the screen. This reduces the stapling on the wire to a minimum. The screens are set in a line to discharge onto the same belt conveyor over which the hogs are mounted, and are mounted over a concrete flume through which the water is discharged to the river.

Screw Presses

At this point the moisture content of the refuse is approximately 75 per cent. This is reduced to between 48 and 50 per cent by means of two single-screw bark presses operating in tandem. The reduction in moisture content is dependent upon the species, quantity of refuse and moisture content before entering the presses. The belt conveyor from the hogs and screens is arranged to discharge into either one or both presses. In tandem operation, the bark is run through one press in which the moisture content of the refuse is reduced to about 60 per cent, then discharged onto a portable, inclined belt conveyor, and carried to the second press where the moisture content is reduced to the final point. With the presses in tandem, approximately 140 tons of refuse on a bone-dry basis can be handled during a 24-hour period. A plow-off arrangement on the belt conveyor from the screens also permits single-press operation in the event one or the other of the bark presses plugs or is down for repairs. In single-press operation about 110 to 120 tons of refuse on a bone-dry basis can be pressed and the moisture content reduced to an average of approximately 54 per cent. Each press rotates at 36 rpm and is driven through a speed reducer by a 75 hp., 870 rpm motor.

In tandem operation, the power requirement for each press varies between 30 and 40 hp. with an occasional peak load demand of 70 to 80 hp. when the supply of refuse to the press is slow. When the supply of refuse is slow or irregular, there is some tendency for a plug to form in the screw until more refuse is fed in to push the plug through the press. In single operation, the power requirement varies from 40 to 50 hp. with peaks up to 90 hp. when the feed to the press is slow. Excessive quantities of sawdust created a tendency for the presses to plug and it was found necessary to distribute the sawdust uniformly with the other refuse in order to minimize plugging.

From the presses the refuse is conveyed over a second portable belt conveyor to a chipper, from which the screen has been removed, which is used to break up the press lumps. It is planned to experiment with a hammer-mill at this point in order to reduce the size of the refuse particles for better burning. The chipper discharges onto an 18-inch belt conveyor which in turn is arranged to convey the refuse into the storage tanks or discharge into an inclined chain flight conveyor carrying the refuse directly to the boiler. The refuse also can be divided between storage and the boiler by means of an adjustable plow on the 18-inch belt conveyor.

Leach Casters

Storage facilities consist of two 26 ft. diameter by 32 ft. high steel tanks each of which is equipped with a "leach casting" machine for feeding refuse from storage to the boiler uniformly. The machine consists of a square vertical shaft the full height of the tank on which are mounted, and supported by cables from the top, four horizontal arms or sweeps each about one foot less than the radius of the tank in length. Plows about 10 inches long are mounted on the under side of each sweep. The vertical shaft is rotated by means of a beveled gear and pinion at the top driven by a gearhead motor. The sweeps in turn are rotated by the vertical shaft and sweep the refuse from the surface to the discharge hole.

Before the tank is filled, a tapered plug the height of the tank is set in place over a hole 11 inches in diameter in the bottom of the tank and about two-thirds of the radius of the tank out from the center. When the tank is full, the tapered plug is withdrawn by means of an electric winch. This leaves a tapered hole through the refuse, and, as the sweeps are rotated, the refuse is plowed from the surface to this hole and drops through to a belt conveyor under one tank which carries the refuse to the inclined conveyor going to the boiler. Refuse from the second tank drops directly onto the inclined conveyor. The refuse is raised to the top of the tanks by means of a bucket elevator into which the 18-inch belt conveyor from the chipper can be made to discharge, and is distributed to the tanks by means of a screw conveyor. The screw conveyor has been found to be an excellent means of conveying pressed wood refuse.

Steam Boiler

The boiler is designed to burn wood waste fuel, in suspension, having a moisture content up to 58 per cent to produce 50,000 pounds of steam per hour at 450 pounds psi working pressure and 150 F. superheat. It is equipped with three combination oil and wood burners, oil being used for start up. The boiler consists of four sections with water cooled side, rear and front walls and roof tubes. The air needed for further flash drying, at the points where the refuse enters, and for combustion is supplied by a forced draft fan through an air heater having a heating surface of approximately 12,000 square feet, and is preheated to a temperature of about 550 F. The preheated air enters the front of the boiler at the burners to provide flash drying and through the bottom to aid combustion particularly when larger pieces of refuse are not burned in suspension and drop to the bottom. The boiler is also equipped with an induced draft fan. The refuse is intended to be introduced into the furnace by means of specially designed blowers. However, tests are being made to improve the operation at this point to eliminate entirely the tendency for fibrous material to "hang up" in the chutes from the blowers.

Considerable progress has been made in improving the operation of the new system as indicated by the fact that steam cost has been reduced about 36 per cent below that for coal as improvements to the entire system have been made and down time reduced. The value of the wood waste as fuel is well illustrated by the following typical analysis of the refuse leaving the bark presses:

	Bone Dry	As Received from Bark Presses
Moisture, %	0.0	49.8
Volatile matter, %	81.0	40.7
Fixed Carbon, %	17.8	8.9
Ash, %	1.2	0.6
Btu	8816	4426

Wood waste from spruce, balsam, poplar, tamarack and jackpine in varying quantities is disposed of through the system. Each has its own characteristics which vary with the season and affect the operation of the various pieces of equipment. These effects are being classified with a view toward improving operations and reducing downtime due to plugs to an absolute minimum.

Principal Equipment

Rotary Screen—
Designed and built by M and O Paper Co.

Flat Screens—
Tyler-Niagara 3 x 8 ft. type 300 single deck . . . W. S. Tyler Co.

Hogs—(sizes 35 and 38)
Diamond Iron Works

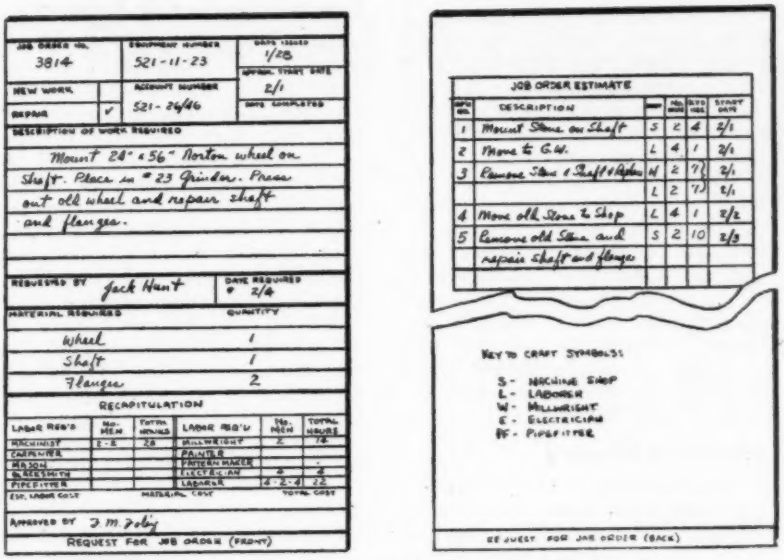
Conveyor System—
Link-Belt Co.

Screw Presses—
American Defibrator Inc.

Leach Casting Machines and Tanks—
Charles H. Stehling Co.

Steam Boiler—
John Phillips Badenhausen Inc.

How to Plan Paper Mill Maintenance



JOB ORDER NO. 3814 — EQUIPMENT NUMBER 521-11-23 — DATE ISSUED 1/28 — APPROX. START DATE 2/1 — NEW WORK — REPAIR ✓ — ACCOUNT NUMBER 521-26/46 — DATE COMPLETED

DESCRIPTION OF WORK REQUIRED

Mount 28" x 56" Norton wheel on Shaft. Place in #23 Grinder. Press out old wheel and repair shaft and flange as.

REQUESTED BY Jack Hunt — DATE REQUIRED # 2/4

MATERIAL REQUIRED	QUANTITY
Wheel	1
Shaft	1
Flanges	2

RECAPITULATION

LABOR REQ'D	NO. MEN	TOTAL HOURS	LABOR REQ'D	NO. MEN	TOTAL HOURS
MACHINIST	1-2	20	MILLWRIGHT	2	16
CARPENTER			PAINTER		
MASON			PATTERN MAKER		
BLACKSMITH			ELECTRICIAN	1	4
PIPEFITTER			LABORER	4-2-4	12
EST. LABOR COST		MATERIAL COST			TOTAL COST

APPROVED BY J. M. Foley

REQUEST FOR JOB ORDER (FRONT)

JOB ORDER ESTIMATE

OPN. NO.	DESCRIPTION		No. MEN	EST. HRS.	START DATE
1	Mount Stone on Shaft	S	2	4	2/1
2	Move to G.W.	L	4	1	2/1
3	Remove Stone & Shaft & Replace	M	2	7½	2/1
		L	2	7½	2/1
4	Move old Stone to Shop	L	4	1	2/2
5	Remove old Stone and repair shaft and flanges	S	2	10	2/3

KEY TO CRAFT SYMBOLS:

S - MACHINE SHOP
L - LABORER
W - MILLWRIGHT
E - ELECTRICIAN
PF - PIPEFITTER

REQUEST FOR JOB ORDER (BACK)

Fig. 1—Describe job, estimate material and labor requirements

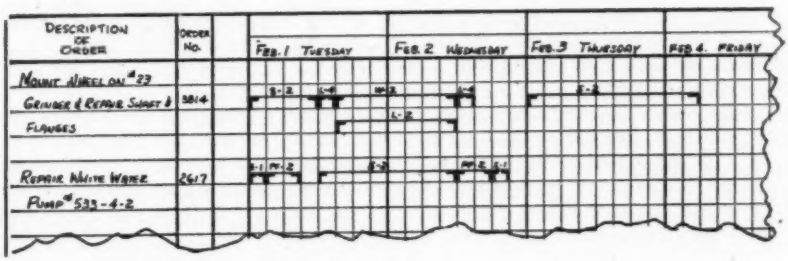


Fig. 2—Project estimates on graphic chart

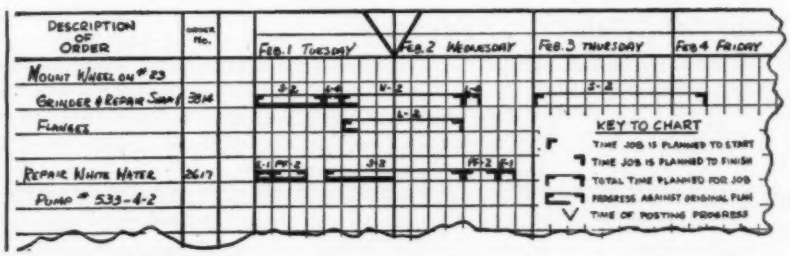


Fig. 3—Post daily progress on estimate chart

When you consider that maintenance costs average nearly 5 per cent of industry's sales dollar, and in some branches of industry run as high as 10 per cent, it is surprising that all companies do not devote a larger portion of their management effort toward maintenance. After all, the same principles that govern production operations are equally applicable to the maintenance of equipment used in production. In discussing the problem in THE PAPER INDUSTRY last month, Mr. Winston outlined how to organize a maintenance department. Now he and one of his associates discuss another phase of maintenance management.

Winston

Hamlin

C. C. WINSTON, Senior Staff Engineer
S. C. HAMLIN, Staff Engineer
Wallace Clark & Company

▶▶▶ THERE IS A COMMON feeling among maintenance personnel that the work of the mechanics cannot be planned, even a day in advance. They argue that it is impossible to tell when breakdowns will occur; that these breakdowns continuously interfere with any planned work, and that it is, therefore, wasted effort to attempt to plan the work.

It is recognized that it is difficult to estimate maintenance work and that even in the best run plants emergency breakdowns will occur. However, we have demonstrated time and again that a detail plan can be made at least one day in advance, and that, on the average, this plan can be adhered to better than 80 per cent of the time. As the reports from the scheduled inspections become available, emergency breakdowns are minimized and the percentage of adherence to plan becomes greater. If the job estimates are properly prepared and the dates wanted are realistic, the next day's work for the mechanical crews can be planned from these estimates.

Need for Planning

This planning must be simple and easy to operate, but it must cover all of the work of the maintenance forces. Too many times concentration is on the large overhauls and repairs. This assumes that the smaller and equally important jobs will *get themselves done.* Too often these are completed only when a production supervisor howls long enough and loud enough to get action, and then, to satisfy him, craftsmen are pulled temporarily from the major to the smaller job.

Obviously, such switching of craftsmen results in economic loss, the extent of which is determined by the time lost in changing from one job to another. If this switching becomes common practice, the mechanic never can be certain when he will be expected to

finish an assigned job without interruption. The psychological effect is bad. The mechanic's pride of accomplishment in seeing a job well done, and on time, has been sacrificed; he loses respect for his supervisors, and his morale and enthusiasm gradually become lowered.

Job switching is only one obstacle to a smooth flow of work; only one instance contributing to low productivity of the worker.

Proper planning will lower maintenance costs by providing:

(1) Adequate preparation — tools, parts, materials, mechanics.

(2) Formal instructions to the workers as to their order of work for the following day or days.

(3) Proper tie-in between crafts.

(4) Proper job priority so that equipment downtime is kept at an economic minimum.

(5) Insurance that all jobs—large and small—are complete once they are started.

The fundamental rules applying to production planning, without some of the refinements, are equally applicable to the maintenance planning operation.

Analyze the Jobs

In many paper mills the maintenance forces exceed thirty mechanics. In mills of this size, detailed day-to-day planning should be taken from the foreman and delegated to a maintenance planner. Depending upon his skill and job knowledge, he may or may not need assistance in estimating the work. In larger mills the estimating may be a full-time job for the master mechanic or his assistant. There is no question but that accurate and complete estimating of all jobs is a prerequisite for planning.

Another aid to good maintenance planning is complete instructions on all job orders. These data should include the charge number for accounting purposes, description and number of equipment, date order is issued, by whom the work is requested, and the date work is required to be completed. The job order is made up in several copies; one for accounting for opening notice and cost accumulations; one for each craft involved on the job; and one for the planner-estimator team. The planner's copy lists the material required, as well as the labor by craft man-hours and elapsed time.

A representative job order and estimate appear as Figure 1. Here is the complete description of the work to be done and a detail breakdown of each labor operation.

Why Estimates Are Necessary

The labor estimate serves a two-fold purpose. First, it breaks the job into major elements or operations. This provides an accurate medium for determining what crafts are needed and in what sequence. Second, it serves as a mechanism by which each operation may be related to time in terms of the original estimate, then adjusted according to actual accomplishment. This provides the planner with the necessary data so that he can organize a large number of jobs and chart their course.

When job priority has been established by the maintenance superintendent, the planner files the job order by start date of the first operation. This start date is determined by the length of the entire job, working backward from the date wanted. Filing in this manner automatically provides him with a signal as to when the job should be started and relieves him of the necessity of carrying the job in his *hat*.

Charts Aid Planning

The planner's next step is to portray graphically these estimate operations as they are to be undertaken. Here we use a project type of Gantt chart to good advantage. This shows, graphically, the work to be done, the length of time it should take, and the crafts required. Figure 2 shows how the estimated job is laid out on the chart before work actually is started. All jobs are planned ahead in this same manner for all crews for the following day. The plan is then relayed to the foremen through a daily order of work sheet. This order of work is issued to the crafts the afternoon before the work is to be done, and allows ample time for drawing parts, tool, and materials from stores before the actual work is to start.

Emergencies Can Be Handled

Even in the best maintained mills there always are some *rush* or *emergency* jobs due to breakdowns or necessary process changes. The number of these jobs varies from week to week, and the fact that they occur at all leads most maintenance people to believe that no planning can be done. Planning *is possible* and very beneficial. However, it must be done on the basis that this is the next day's plan if nothing more important comes along.

Estimates themselves are subject to readjustment as the jobs progress. For this reason only a full day's work is planned in advance, with each operation being planned to conclusion. As progress is posted to the planning charts — twice daily — each operation that is behind or ahead of schedule is so noted on the chart (Figure 3). This allows rush jobs to be inserted with the least disturbance to assigned work. The graphic picture aids the operating people in seeing what other jobs will be affected by their rush jobs, and after seeing this picture they often decide that these projects are not so *rush* and can be delayed a few hours, or even until the next day.

Benefits from proper planning are definitely measurable. You can expect about 20 per cent more useful work from your crews, better relations with the production department, and reduced downtime.

Wax Solubilities . . . Addendum

Two graphs (Figures 2 and 3) were used to illustrate article entitled *Solubilities of Waxes in Alcohol and Other Solvents* by T. T. Collins, Jr., which article began on page 58 of the April (1950) issue of this magazine. The tabular, explanatory legend reproduced here was not presented with the graphs shown in Figures 2 and 3.

Legend for Figure 2 and Figure 3

Curve	*Wax*	*Additive (A)*	*Solvent**
I	Aristowax 160/65	—	90% isopropyl alcohol
II	"	5 Staybelite	"
III	"	15 "	"
IV	"	—	Ethyl Cellosolve
V	"	15 Staybelite	"
VI	"	—	99% isopropyl alcohol
VII	"	—	4 parts 99% isopropyl alcohol 1 part toluene
VIII	"	15 Staybelite	"
IX	Paraffin 138/40	—	90% isopropyl alcohol
X	"	5 Staybelite	"
XI	"	15 "	"
XII	"	—	99% isopropyl alcohol
XIII	"	15 Staybelite	"
XIV	"	—	Absolute methyl alcohol or 190 proof ethyl alcohol (Solox)
XV	Aristowax 160/65	—	Methyl Cellosolve
XVI	Paraffin 138/40	—	Acetone
XVII	"	—	Methyl Cellosolve
XVIII	"	—	Ethyl Cellosolve
XIX	"	—	Isobutyl alcohol

(A)—Parts by weight to 1 part of wax.
*—Percentage by volume and parts by volume.

Paper and Paperboard Making—IV

HARRY WILLIAMSON

Questions other than those covered here (as well as other installments) will be welcomed by the author. In so far as possible, answers will be published in connection with this series. Subsequent installments of his work will take up the subject of the cylinder machine.

Questions on Beating . . . Answered

DISCUSSED HERE ARE QUESTIONS that pertain to the operation of any standard type beater, jordan, freeness tester, fourdrinier machine head box or cylinder machine mold vat. You will find your own efforts at answering these questions; regardless of your education, experience or both, informative and interesting. The only rule is that you should answer them to yourself now without further reference to either these or any other writings. You will then have your own yardstick of what you actually *fully* know and what you are a little doubtful about on this most important subject of beating and CONTROL of beating stock in the making of a sheet of paper.

This is the kind of information you MUST HAVE if you are going to create a formula, beat and jordan the stock, set the machine speed and produce paper up to standard and without waste. For instance, conversion costs are $80 per hour. Every thirty minutes the sheet is off standard quality you are $40 in the hole. If the machine is not running at a speed to produce that much then your conversion cost goes up. Try your hand. This is being in full charge of a paper mill in mental responsibility without risk of criticism or being fired if you do not make good. Incidentally, choose your own grade. The only things you need to know about the paper machine to play this game is that it has enough forming area; the wire mesh and weave is suitable to the grade you want to make; so are the felts; vacuum and pressing capacity will put the sheet into the drying section for you at 62 per cent bone dry and there is enough drying surface and steam to dry your paper at a production rate of 5000 lb. per hour. Now go right ahead; the mill is all yours.

Seventeen Questions—

(1) How many kinds of stock are you going to use and what percentage of each?

(2) Will you beat the total furnish off equally or allocate separate amounts of time for each kind of stock?

(3) Will the beater roll be hard down from the start of beating. If not for how long will it be hard down and why?

(4) What do you consider is the primary function of a beater?

(5) What do you consider is the secondary function of the beater?

(6) What do you consider is the total work of the beater?

(7) Is there any possibility of creating a variation in stock values when dumping a beater charge of say 6 per cent consistency into the beater room reserve chest? If so, what steps will you take to eliminate this possible variation?

(8) How can you measure, with any degree of accuracy reasonable to quick correction, the total work done on the fibers by the beater at the end of any given period of time—say ½ hour—1 hour—1½ hours?

(9) Can you distinguish, by any form of measurement the *kind* and degree of any of the functional work performed by the beater at the end of any given period of time?

(10) If so, can you stop the beating process at any given period of time and be *sure* the resultant paper will possess the values as indicated by this applied measurement?

(11) What do you know about any form of freeness test?

(12) What is any freeness test based on; volume or time?

(13) Which is most important for you to know for accuracy: the volume of water draining from the sample being tested or the time it takes to drain or both? What about the water that does *not* drain out of the sample test, does this tell you anything?

(14) You have already taken freeness tests of each beater dumped into the beater room chest which supplies the jordan head box directly. Should you now take a freeness test of the stock entering the jordan and if so why?

(15) When you take a freeness test of the stock leaving the jordan, what information will you deduce from the results?

(16) Can you take a freeness test of the mixed volume; stock and white water, at the paper machine head box or the cylinder machine vat? How and with what can you make such a freeness test sufficiently quickly and accurately to be useful?

(17) Assuming you could make such a test in what manner would the information be useful to you to minimize potential fault in the finished paper.

An Answer for Each Question

Answer No. 1

The use of multiple types of stock to produce a given sheet of paper is governed by the final qualities necessary in the sheet to fulfill the commercial requirements of the usage the paper is made for.

Examples:

(a) NEWSPRINT—furnish 12 per cent unbleached sulphite, 88 per cent groundwood. The sulphite is the long fiber for strength and the groundwood is the fine filler fiber to give a sufficiently *closed* formation necessary for the speed of the printing and the kinds of inks used in newspaper printing. The strength requirements are low; 10 pound tensile is the major test, therefore, very little beating as such is required.

(b) KRAFT CEMENT BAG—furnish 100 per cent unbleached kraft pulp. The strength requirements are high; 85 per cent to 95 per cent mullen test and 220 per cent to 240 per cent tear test *with* the grain. Test specifications are expressed as percentage of ream weight. In addition, the sheet must have low density so that the air will be readily expelled as the cement is poured in. Long well beaten fiber to develop the mullen test. No CUTTING so that the tear value inherent primarily in the LENGTH of the fibers will be retained and enhanced by entwining in the process of formation. Formation, relatively OPEN to provide low density. Note—If this same furnish is also CUT up a little in ADDITION to the beating then the fiber length will be shorter, the tear value will be less, the mullen test will RISE to 100 per cent, the density will be *higher* and the formation *more closed*. This second sheet would fill the requirements of kraft *grocery* bag and kraft wrapping.

(c) BOND PAPER—furnish 70 per cent bleached sulphite, 30 per cent high bleached soda pulp. The sulphite is for the strength values; mullen, folding and creasing, tensile and stretch. The soda pulp is a short filler fiber used to aid in CLOSING up the formation of the sheet. If this closeness of formation were effected by cutting up the long fibered sulphite then some of the folding and tensile qualities would have to be sacrificed and the resultant sheet would be hard. All the beating as such, is done on the base furnish, the sulphite.

After this work has been accomplished the soda pulp is added. If the soda pulp is added *before* the beating has been accomplished on the long fibers, the shorter fibered soda pulp will cushion the impact of the beating blows and delay the development of the sulphite without any corresponding gain to the soda fibers. This last statement is only true when the beating unit is the Holland type and the consistency of the furnish between 5 per cent and 7 per cent. It is *not true* either when pressure control jordanning is used as the beating unit or on *any* type beating unit where the consistency of the stock being beaten is below 4 per cent. FLEXIBILITY rather than high mullen and tear are the characteristics to be developed from the sulphite; close formation and brightness are the functions of the high bleached soda pulp.

Answer No. 2

Depends on the final characteristics of the commercial purposes of the finished sheet.

Answer No. 3

Depends entirely on how much CUTTING by *shear cut* is required as compared with a bruising cutting shortening of the fibers. For either of these two kinds of cutting it must be remembered that *all* fibers of the wood fiber family will cut more *easily* while they are still unwetted and harsh to their NATURAL degree of stiffness. As the fiber becomes more wetted by the beating action, the stage of transition from harshness to hydration the fiber will be more yielding to the impact of the heating blows and there will be LESS SHEAR CUTTING and more of the bruising type cutting. Should the principal requirement of the sheet be RIGIDITY, then shear cutting will enhance this value and the beater roll can be put down hard at once. However, if the requirements are predominantly strength and flexibility, then a *gradual* lowering of the beater roll during the wetting up period and the FULL beating weight of the roll after this transition stage has been reached is the better method of achieving the desired results.

Answer No. 4

THE PRIMARY FUNCTION of the beater, or any BEATING unit is to develop that CONDITION in the fibers beaten, which, on drying will become a compacting and contracting force drawing and holding the fibers together more firmly and tenaciously as a continuous whole than the effect accomplished by the ACT of formation. When speaking of fibers from the wood family group, the most commonly used name for this developed condition is hydration. When speaking of fibers from the seed hair family, particularly those fibers of high alpha-cellulose content in their natural state such as cotton, the common terms applied to this development of fibers by beating are fibrillation, fibrillae, and fibrage.

Answer No. 5

THE SECONDARY FUNCTION of the beater in *value* is the separation of the MASS of fiber into individual fibers, and, *if necessary* either by shear cut or bruising cut, shorten the fibers to a desired length. This work precedes the primary function, the development of the fibers by the beater in point of time; it is secondary in point of total value of work done by the beater. This secondary function is very negligible when using either slush pulp or lap pulp supplied on the same operating property on which the beater room is located.

As an extreme example, there is most certainly no

secondary function of the beating unit required if the total furnish is soda pulp in slush form; fibers of 1.00 mm. in length already in a condition to be pumped through pipes in liquid form. The opposite extreme would be 100 per cent rag pulp fed to the beater in the form of half-stock. The rags have not been completely disintegrated either by the cooking or washing and the beating unit has quite a lot of preliminary work to accomplish before the work of the PRIMARY FUNCTION, the developed *condition* of the fiber, can be proceeded with.

The *whole* of this secondary work could be done by many other forms of cutting and disintegrating mechanism but the DEVELOPMENT of the fibers which we understand by the various names such as HYDRATION or FIBRILLATION must still be performed by the application of a force in the form of frictional slippage or rubbing blows.

As will be noted from the example of kraft cement sack from slush fiber cited in Answer No. 1; assuming the Holland type beater as the beating instrument there is no secondary function at all. As the fibers reached the transition stage of development between harshness and hydration they slip apart into separate fibers, and there is most certainly no desire to shorten the fibers; on the contrary, every effort is made to so arrange the beating to brush and draw the fibers out into thinner and longer units.

Answer No. 6

The TOTAL WORK of the beater is a duplication; in greater UNIT VOLUME, of the beating values effected by the early papermakers by their use of pestle rubbing and flat stick beating. That work is (a) the separation of MASS fiber into individual fibers; (b) the cutting, by shear cut or bruising cut, of the fibers to the desired length; (c) the REDUCTION of the fibers thus producing a proportion of FINER PARTICLE SIZE FIBRILLAE, and (d) the development of hydration. (c and d) constitute the *primary function of beating*. (a and b) constitute the secondary function of the beater. The Holland type beater was a logical development to meet increased demand at a period of time when rags as rags and not just fiber was the predominating source of raw material used. The *secondary function* of the Holland type beater is important from a production angle when making paper from either rags or rag half-stock; or other fibers of the seed hair family. It is not important when making paper from fibers of the wood family group, and with certain furnishes *can* be disadvantageous.

Answer No. 7

YES. (a) The only quick operating method we have of checking WORK DONE is by the use of a freeness test. The addition of white water to reduce the 6 per cent stock from the beater to the reserve chest which supplies the jordans with 3 per cent stock, contains FINES. These fines will change the freeness VALUE of the stock delivered to the jordans inlet; the greater the amount of fines the more slow the stock will *appear* to be. This false figure of freeness causes a misinterpretation of the *true* amount of work done; *the important work of actual beating*.

(b) The common practice of opening the dump valve of the beater and dropping all the 6 per cent stock that will flow and *then* washing down with white water will make the stock in the reserve chest temporarily too heavy. As the supply from the reserve chest to the jordan inlet is continuous then the consistency of the stock entering the jordan will change. The *value* of the work done *by* the jordans changes with the consistency of the stock on which the jordans work. The OPERATING EFFECT on the finished sheet of paper of such change is from *negligible* to *very serious*, according to grade and ream weight of paper made. *Heavy weight papers* carrying heavy clay loading material; *very serious. Lightweight papers* with no loading materials; *negligible*.

CORRECTIVE ACTION. (1) Install a consistency regulator working continuously on the beater room reserve chest. The piping so arranged that the stock going to the jordan inlet *must* pass through the regulator. (2) Turn the wash down water on the beater *before* opening the dump valve. (3) Check every grade made in the mill for freeness with and without the white water used for dumping and make up a standard chart showing the *true freeness* figure of work done by beating and the deductible figure of slowness caused by addition of fines.

Answer No. 8

By CALIBRATING the TIME of water drainage while forming the sample of pulp tested with the BONE-DRY WEIGHT of the sample of pulp tested. This can be done by using any standard freeness test or a test of your own devising.

Answer No. 9

YES. Any work done on papermaking fibers by any form of mechanical application of beating or cutting force will change the TIME RATE of water drainage through the wire mesh of the testing device on which the fibers are formed into a small testing sheet. This drainage is TIME RATE OF FORMATION. However. The drainage test is a measurement of the total work done and does not distinguish between BEATING development and CUTTING or shortening the fibers. We must, therefore, use another unit of measure to equate the difference between development work, hydration and shortening the fibers by SHEAR CUTTING. It is *important* to *differentiate* between shear cutting shortening, bruising shortening, and *reduction* of fibers such as happens in the beating of fibers from the seed hair family. When we shear cut any fiber we shorten the length of the fiber but we do not create either fibrillae or fine particle size fiber which, in their further development, will add COHESION and INTERLOCKING TEARING STRENGTH to the formed paper. We *do increase* mullen or bursting strength and density, but by shear cutting we *decrease* tearing strength. By making a hand sheet of the long fiber; the BASE furnish, and getting the tearing value of the de-fibered UNBEATEN stock and then comparing the tearing value of a hand

sheet made from stock at any stage of stock preparation work performed by any type of mechanical unit; or after the addition of shorter fibered pulp such as soda or soft hardwood, we have a COMPARABLE UNIT of measure to distinguish between the different functional work of the beating units. These hand sheets do *not* have to be submitted to a period of time to regulate the moisture content. Providing they are made under the *same* general conditions and on the same day, any appreciable amount of cutting will show a difference in tear value sufficient for *all practical operating purposes.* It is well, however, over a period of time, to establish *accurate* information by making and testing sheets of the BASE FURNISH of each grade of paper made by the accepted standard methods.

Answer No. 10

YES. By measuring the BASE FURNISH values and the necessary work to be done to develop those values; standardization of formulae, degree, and total amount of stock preparation may be set up in the form of a very few simple written instructions to the operators. The use of the calibrated S/W freeness test permits operating *control* of stock preparation by any EIGHT-MINUTE PERIOD. The use of the Schopper Riegler freeness test permits operating *control* by any 25-minute period. Both tests for control using the bone-dry sample. By using the wet sample test either one of these freeness tests will give *approximate* information, to be used as a guide only, any period of four minutes.

Answer No. 11

The Paper Mill Chemist, by Henry P. Stevens, M. A., revised and enlarged edition published in 1919, (first edition 1908), has this to say about the freeness test. "During the past few years attempts have been made to construct an instrument which will give a measure of the condition of the beaten pulp. Thus a known volume, say 1000 cc. of the pulp taken direct from the beater may be poured into a 1000 cc. graduated glass cylinder with a false bottom made of ordinary machine wire." "If the pulp is slimy and wet, it may be better to take an aliquot part of 1000 cc. and dilute it to 1000 cc., well mixing before using."

In a later paragraph he describes in detail the operation of the Schopper Riegler freeness test quoted in these writings. In his closing paragraph Mr. Stevens has this to say; "It is possible also that the time taken for a definite amount of pulp to drain may yield as valuable results as a measurement of the volumes of fast and slow running water in the manner described."

In the 1919 edition, he speaks of "attempts in the past few years," describing the Schopper Riegler test substantially as it is used today; he also cites suggestions for making freeness tests by Klemm.

The first time this writer ever saw any form of instrument designed to make a freeness test was in a newsprint mill in Newfoundland. This was in 1913-1914. The furnish of the sheet was 84 per cent ground wood and 16 per cent unbleached sulphite; (we were very generous with sulphite in those days). The climate of Newfoundland has been variously described; this writer experienced from 20 degrees below zero in winter to 95 F. in the summer. We had four definite seasonal changes in the drainage value of the ground wood due to the difference in temperature of the large volumes of water used in grinding the wood. These seasonal differences in drainage time of the major part of the furnish made such radical difference in the formation time of the machine and gave so much operating trouble to those of us running the machines they were referred to in paper making vocabulary more forcefully descriptive than polite and compared to the seasonal effects on the human body of spring and summertime after feeding principally on imported canned food.

A young man working in the inspection department (who had not been too popular with the machine room personnel because it was part of his duty to cull off grade paper) devised a freeness tester rigged up with parts of an old alarm clock to measure and time the volume of fast flowing water from a known volume of groundwood. This instrument, crude as it was, showed such promise that the grind stones in the groundwood mill were ground with a seasonal roughness by changing the bur in order to produce a groundwood of the *same drainage time* regardles of the temperature of the water. The operating results of this early *control* by freeness of the *major* portion of the furnish so much improved the regularity of the running of the paper machine, that this hitherto barely tolerated inspector became the hero of *we*—the Royal Family of Papermaking—*the machine tenders.*

In the volume production of common papers today the required freeness test is set up by the technical department or the superintendent. The acceptance and use of this test is quite matter of course; and where the operations are limited in scope, by making *one* grade of various ream weights, the *full possibilities* of a freeness test are neither necessary nor recognized. Where a variety of grades with widely varying required specifications in the finished papers mean all the difference between a completed sale and a rejection, *it is absolutely essential to control* of operations that the freeness test be understood thoroughly and used in all its possibilities.

Answer No. 12

The basic principle around which *all* freeness testers are built is the fact that *water,* in very large volume ratio to stock, is the *only* carrying medium by which millions of microscopically FINE PARTICLES OF FIBERS and their eye range visible parent fibers can be interlocked and felted with each other into a continuous sheet of paper. During the process of this ACT of formation, the ratio is 99 parts water to one part papermaking stock. Formation of the sheet is effected by draining the carrying water through a traveling woven wire mesh and leaving the fibers and other components of the paper on the surface of the traveling wire. Here we are between the devil and the deep blue sea; the size of the openings or mesh of the woven wire cloth, and the physical dimensions of the individual components of the stock from which the paper is to be formed. If we have the mesh too large, then we will

loose too great a proportion of the fines through the mesh and the *formation will be effected too suddenly*, and, therefore, will be LUMPY and UNEVEN. That would be fast or FREE FORMATION. If we have an extraordinary fine wire mesh the water will be held back from draining through too quickly; the fibers etc., will have more *time* to form together, and, as a result, the *formation will be effected slowly* and will be much more *uniform* and *even*. That will be *slow formation*. The machine tender describes his operation of forming the paper as *slow* or *free* according his observations of the *time* rate at which the carrying water drains through the wire mesh and *forms* the sheet.

We also know that as we BEAT the stock, we create hydration and particle size fibrillae, and as we CUT the stock, we shorten the fibers so that more units of fiber will form together per square inch of wire forming area through which the carrying water has to drain. Therefore, the drainage time rate of water through the wire mesh will *change* as the *amount* and/or *degree* of work done by stock preparation is changed. The *necessity* for some form of measurement of the drainage of water through a wire mesh when used as the forming medium to make a sheet of paper is at *once* obvious.

An interesting point to note is that the papermaker did not get around to devising a unit of measure and record until some time between the first edition of the *Paper Mill Chemist* in 1908 and the second edition in 1919 which still treats the subject of freenes test with *scientific doubt* to say the least. Probably the fact that in that era the fourdrinier machine passed the 500 fpm mark in running speed and the problem of water drainage time in relation to formation speed became more noticeable, influenced the experiment.

All freeness testers are based on a UNIT VOLUME of water. The Schopper Riegler (probably the father of freeness testers) and this writer's adaptation of a S/W form of freeness test are both based on a total volume of 1,000 cc. Of this total volume, the Schopper test uses 6 grams of hand squeezed stock so that the ratio of water to stock to make the freeness test is 944 cc. water to 6 grams of wet, but not liquid, stock. (Those figures are close enough for understanding the principle of the freeness test.) The test, then, is to form the fiber content and measure the volume of water draining through the wire mesh while the small sample sheet is being formed.

A graduated glass tube is used to catch the water. On the one side, the graduations read from the bottom *up* from 1 to 1,000 cc., and on the other side the graduations read from the top *down* in degrees from 1 to 100 by tens. Assuming that after the sample is formed the contents of the glass reads 800 cc., we have *two* figures of record: 800 cc. volume of water which did drain through the wire mesh, and 200 cc. of fiber and water which *did not* drain through the wire mesh. By pressing and drying the sample sheet *bone dry* and then weighing it in grams *three* figures are obtained: 800 cc. of water which drained more or less freely, 3 grams of bone-dry paper and the indicated 3 grams of water which had to be pressed and dried from the original hand squeezed pulp and the remaining 194 cc. of water which could not drain through the physical density of the formed sheet and the wire mesh. In many mills the beating instructions are written on the basis of the free flowing water, measured in cc. *only*—such as "beat to 800 cc." This is a volume test and in relation to total possible accuracy it is an approximate test. In other mills the test is by degrees and time—"beat to 20 degrees in 80 seconds." This means that the time to drain the 800 cc. of water is also noted. Obviously this is a much closer bracket of accuracy because of the rate at which the water drains is also included. This method is volume and time.

Answer No. 13

Development of the inherent values of the fibers used is the work of the stock preparation units. Formation of the fibers into a continuous sheet of paper containing those values is the work of the paper machine. As we develop the hydration of the fibers, using laboratory equipment where we positively *know* cutting *cannot* take place, the water of formation will drain *more slowly* as the hydration increases; therefore, the *time rate* of water drainage under these conditions becomes a positive measure of the DEGREE OF HYDRATION developed. The paper machine is run at a given speed of linear feet per minute. Whether the formation takes place on a horizontal plane as it does with a fourdrinier machine or on the surface of a cylindrical rotating mold as it does with a board machine is entirely immaterial; in both instances the production is in *continuous feet per minute*, therefore, the *time rate* of water drainage to *effect* formation is the most important factor of information to *control* operations. As all freeness testers are based on a known UNIT VOLUME then the TIME of the draining of FREE WATER brings the bracket of control still closer. As the water of the unit volume which *did not* flow freely through the forming sample is the reciprocal of the volume that did flow through; then the noting of this volume in degrees co-related with seconds of time as with the more accurate use of the Schopper Riegler test is more important than the noting of *volume alone*.

Answer No. 14

YES. The freeness tests taken during the BEATING of the furnish give you information of the amount and rate of work done by the beater units. By taking freeness tests at the jordan inlet you note the effect on freeness of the white water used in dropping the beaters and reducing the consistency of the stock to the consistency required for jordaning. You then have an *accurate* figure of freeness to use when equating the work done by the jordan.

Answer No. 15

Having an accurate figure of freeness of the stock entering the jordans and knowing the thickness of the plug and shell filling, the horsepower used, and the consistency of the stock, you will be able to deduce the type of work done by the jordan by the difference between the figure of freeness of the stock entering and

leaving the jordan. Granting the same conditions as listed above, the wider the bracket of the two freeness figures the greater the amount of CUTTING.

Answer No. 16

YES. You can make a freeness test of the mixed volume at the machine headbox despite the fact that the consistency at this point is usually in the bracket of 0.3 per cent to 0.9 per cent. This can be done by using any standard freeness tester. Simply make a scoop to hold the number of cubic centimeters of the mixed volume which will make a bone-dry sample sheet within the grams weight bracket for which your tester is designed.

Answer No. 17

Freeness tests of the mixed volume delivered to the machine headbox are particularly helpful when making heavy weightpapers loaded with clays, titanium, etc. On such papers the degree of hydration developed by BEATING is necessarily *low*, and usually the proportion of short fibered filler stock is high. Because of the low degree of hydration developed, the retention of the loading material in process of formation on the wire is more variable than is the case with stock hydrated to a higher degree. With such variation in retention of loading materials, fuzzing and picking is more liable to occur, and variation in drying rate resulting in variation in moisture content of the finished sheet causes intermittent trouble. A freeness test of the mixed volume at the machine headbox, compared with the figure of freeness of the stock delivered at the machine STOCK GATE, will inform you as to the amount of FINES passing through the wire mesh into the white water system; then *prompt* action can be taken accordingly.

Stainless Steel . . . What Makes It So?

▶▶▶ WHY IS STAINLESS STEEL stainless? And what makes it so? Many engineers in the pulp and paper industry, and other industries, do not know the answers to these questions. Nevertheless, this corrosion-resistant metal finds many uses in the pulp and paper industry with new applications constantly developing.

Stainless steels owe their remarkably great corrosion resistance to their chromium content, usually ranging from 12 to 27 per cent, depending upon the type of steel and the service for which it is intended.

The principal reason for the remarkable corrosion resistance of chromium-iron alloys is interesting. Chromium is not a noble metal like gold or platinum. Apparently, in the presence of oxygen in some form, a thin, hard film is formed on the clean surface of combinations of iron and chromium. This film is continuous, stable, hard—and so thin that it is invisible. Yet it serves as an effective barrier against progressive attack by corrosive agents, so long as oxygen is in some form available in the environment.

At high temperatures the film loses transparency and eventually becomes a tight, adherent scale which protects the underlying metal against further oxidation. It is this scale which gives high chromium alloys great resistance to oxidation at high temperatures.

One of the early stainless steels was a by-product of cannon research! Attempts to make better cannon linings from steel containing chromium led to the discovery of chromium's remarkable property of rendering iron and steel rustless or stainless. During a laboratory investigation of these linings in 1913, the English metallurgist, Harry Brearley, observed their resistance to attack by various reagents.

Sensing a discovery of unusual importance, Brearley suggested the use of the new steel for cutlery. When the first few knives made from this steel showed no signs of rusting, research was immediately started on the corrosion protection to steel offered by chromium.

After years of research, knives made from steel containing about 12 per cent chromium and 0.30 per cent carbon were developed which took and held a sharp edge and resisted corrosion. Additional research research revealed that the tight self-healing protective film of chromium-iron oxide on the knife makes it "stainless."

The film is resistant to many corrosive conditions, such as exposure to water, air, food juices and alkalis in soaps. The protective oxide is so thin and transparent that it escapes detection by even the most powerful microscopes. When scratched, nicked, worn through or otherwise penetrated, a fresh protective film forms practically instantaneously.

One of the most important elements in stainless steel is nickel, a tough, white magnetic and malleable metal. The manufacture of stainless steels takes more than half of the nickel consumed by the steel industry.

In addition to nickel and chromium various combinations of any of 16 other elements may be present in modern stainless and heat resisting steels. These are aluminum, carbon, columbium, copper, iron, manganese, molybdenum, nitrogen, phosphorus, selenium, silicon, sulphur, titanium, tungsten, vanadium and zirconium. Not all of these are intentionally present in any individual stainless or heat resisting steel. But each of these steels requires at least four of these elements and several series require six. Molybdenum increases corrosion resistance and molybdenum and tungsten increase the strength at high temperatures; columbium and titanium increase corrosion resistance under certain conditions; aluminum and silicon retard a form of high temperature corrosion known as scaling; and phosphorus, selenium and sulphur improve the machinability of the steels. Chromium and manganese are required in every grade of stainless and heat resisting steels; and nickel is used in many of them.—*Contributed by* AMERICAN IRON AND STEEL INSTITUTE.

PAPER SKETCHES

AS EARLY AS THE 12th CENTURY, PAPER ROUGHLY EQUIVALENT TO SUBSTANCE 11½ LB. WAS MADE IN EGYPT, CUT INTO SMALL SHEETS ABOUT 2⅜ x 3⅜ INCHES AND USED FOR LETTERS SENT DISTANCES BY CARRIER PIGEON.

To PREVENT ENGLISH PAPERMAKERS FROM USING INFECTED RAGS DURING THE PLAGUE OF THE 1630's, THE AUTHORITIES RAIDED THE RAG SHOPS AND CONFISCATED THEIR PRODUCT.

The Papermakers OF EARLY FABRIANO, ITALY, GOT SIZING FOR THEIR PAPER BY BOILING THE GELATINE OUT OF WASTE HIDE TRIMMINGS THEY PROCURED FROM THEIR LOCAL TANNERIES.

A SPECIAL PAPER HAS BEEN DEVELOPED FOR USE IN YARN DYEING. THIS PAPER WILL NOT SNAG YARN; WHEN WRAPPED AROUND A TUBE CONTAINING YARN, IT CAN BE IMMERSED IN HOT OR COLD DYE BATHS WITHOUT LOSING ITS SUBSTANTIAL STRENGTH.

The Paper Industry Safety News

New Safety Device Contest

▶▶▶ MOST SAFETY AWARDS are given in recognition of achievement in the broad sense—taking into consideration the over-all effectiveness of a safety program. While each employee and department of a mill must contribute to the program, it is the combined results of the effort of these individuals and departments that constitute the final safety record. This, of course, is as it should be since the real measure of a mill's safety program is the over-all reduction or elimination of accidents.

Nevertheless, safety men long have felt a need for specific achievement awards that might recognize the results of particular safety efforts. One type of achievement that seems to deserve special consideration is the development of devices or equipment that reduce accident hazards in manufacturing operations. Numerous such devices have been brought to the attention of our industry by the issuance from time to time of the National Safety Council "Detail Sheets" that describe and illustrate guards, special equipment, and other safety devices developed by individual pulp and paper manufacturers.

With the realization that only a few of the many such devices in service ever are brought to light for the benefit of the entire industry, the Executive Committee of the Pulp and Paper Section of the National Safety Council has established a *Best Safety Device in the Pulp and Paper Industry* contest. Co-operating in this effort, THE PAPER INDUSTRY will present award certificates to the contest winners and will aid in promoting and publicizing these safety achievements. It is hoped that such recognition will encourage pulp and paper manufacturers to share their safety developments with the entire industry.

It is realized that inventiveness and ingenuity cannot be created by establishing awards. But it is believed that the interchange of ideas emanating from such a contest should stimulate further interest, and that individuals and their companies will be encouraged to devote more effort toward the development of specialized equipment for eliminating hazards.

Contest Rules

1—Sponsors:

This contest is sponsored by the National Safety Council in co-operation with THE PAPER INDUSTRY, published by Fritz Publications, Inc., Chicago.

2—Definition of Device:

(a) As used here, the word device means any tangible thing such as an attachment to a machine or to other objects in the physical working environment. Excluded are methods which involve simply a change in the way of doing things, advertising apparatus such as exhibits or display boards, etc.

(b) The device must be originated by someone in the company submitting the device for contest consideration. It cannot be a commercial device such as, for example, a new toe guard developed by one of the safety equipment manufacturers.

3—Contest Period:

The contest begins July 1, 1950, and will close June 30, 1951. All entries must reach the National Safety Council not later than August 1, 1951.

4—Eligibility:

(a) Entry in this contest must be registered in the name of a company, its mill, or plant, and not in the name of an individual.

(b) Entrants need not be members of the National Safety Council. The basic requirement is that the company submitting the device be engaged in pulp, paper, and/or their converting operations.

(c) In order to make comparisons more equitable, entrants will be classified under one of the following divisions according to the operations conducted:

(1) Logging
(2) Pulp
(3) Paper
(4) Paperboard
(5) Converting

(d) No device can be entered in more than one of the above divisions.

5—How to Enter Contest:

Each entry should be made on the entry blank provided by the National Safety Council. All entries must be submitted to E. P. Marconi, staff representative, National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill. Entries should be accompanied by mechanical drawings, photographs, and written specifications which will make entirely clear to the judges the nature and method of use of the device. In addition, if desired, a model or sample may be submitted. Mechanical drawings, photographs and specifications become the property of the National Safety Council. Models or samples will be returned upon request.

6—Method of Judging:

(a) Entries will be judged by a committee consisting of: (1) One safety specialist from each of the above five divisions of the pulp and paper industry; (2) One independent safety specialist, such as an insurance safety engineer, university safety director, or department of labor safety engineer; (3) An executive of the National Safety Council who will be the chairman.

(b) Appointment of judges will be made by the Executive Committee of the Pulp and Paper Section of the National Safety Council.

7—Basis of Awards:

(a) In order to be eligible for an award, the device must have been in use at least six months but not prior to July 1, 1948. This is to assure that the device will have been tested and found to meet expectations. Such a trial period will also provide experience for the assistance of the judges.

(b) Furthermore, evidence must be submitted to prove that the device has been effective in substantially reducing or preventing industrial injuries. In the event that no accident experience relevant to the device has been sustained by the submitting company, the latter may use nationally accepted statistics as supporting evidence that a hazard exists; or in the absence of these statistics, he may submit authoritative opinions.

(c) The device need not have been designed primarily for the prevention of industrial injury, but if the safety aspect is incidental, it must be proved to be substantial.

(d) The device should not only result in increased safety but also should *not* result in any impractical reduction of work output. Preferably, and it is expected usually, the use of the device will be accompanied by economic benefits.

8—Awards:

(a) A Certificate Award will be given by THE PAPER INDUSTRY to one participant (company or plant) in each of the five divisions (Par. 4-c) whose device fulfills, in the opinion of the judges, the qualifications stated in Paragraph 7. Individuals responsible for the development of the device, will be mentioned in the certificate, if requested by the company.

(b) Honorable mention in National Safety Council publications and in THE PAPER INDUSTRY will be given to winners of second and third place, as well as to first place winners.

(c) Awards will be made at the National Safety Congress in October, 1951.

OIL PAINTING BY L. J. A. NEESE

"Pouring off" in the foundry at Beloit Iron Works, Beloit, Wisconsin. From this big modern plant, embracing over 400,000 square feet devoted exclusively to the manufacture of pulp- and paper-making machinery, have come precision machines of highest quality since 1858.

BAN CORROSION WITH
STAINLESS
BIRTANKS

Stainless steel Birtanks are the best answer to the problem of corrosion in processing or storage. The unequalled resistance of stainless to attack, freedom from maintenance cost, and unlimited life make it far more economical in the long run.

Solid stainless and stainless clad steels are now obtainable and Birtank has the trained technical staff and ample facilities for fabricating vessels of any type or size.

Experienced engineering staff; early deliveries. Tell us your problems and write for quotations.

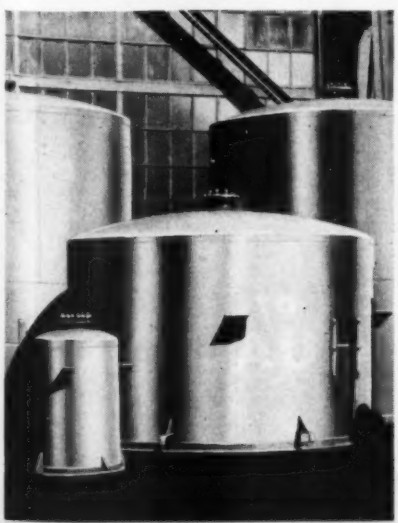
BIRMINGHAM TANK COMPANY

AN INGALLS BIRTANK PRODUCT

MAIN OFFICE: BIRMINGHAM, ALA.
Sales offices in New York, Chicago, Pittsburgh, New Orleans

THREE PLANTS
Birmingham, North Birmingham and Pascagoula, Miss.

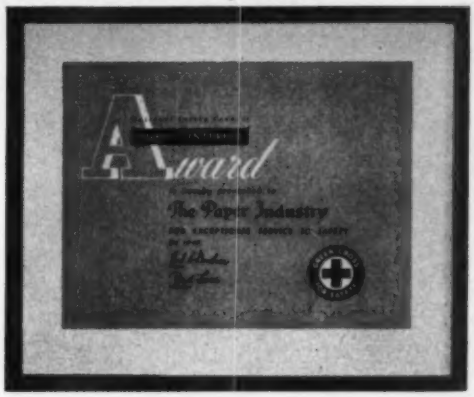
Stainless steel pulping vessels, fabricated by Birtank for a leading soap manufacturer.



Specialists
IN STAINLESS STEEL FABRICATION

The Paper Industry Wins Public Interest Safety Award

Non-competitive awards are made annually by the National Safety Council to public information media for exceptional service to safety. *The Paper Industry* was chosen for one of these Public Interest Awards for 1949. This award went to 31 daily and 10 weekly newspapers, 78 radio and six television stations, two radio networks, one newspaper feature syndicate, nine general circulation magazines, 18 trade journals and 10 advertisers. . . . *The Paper Industry* has sponsored the award of the major trophy in the contests conducted among members of the Pulp and Paper Section of the National Safety Council annually for the past twenty-five years.



Pulp and Paper Section of NSC Has New Group-Insulation Board Mfrs.

At the last Executive Committee meeting of the Pulp and Paper Section of the NSC, a subcommittee for the insulation board manufacturers was formed with 13 companies of the Insulation Board Institute of Chicago as original members. New members will, of course, be welcomed.

The first real get-together of the new group will be at the 1950 Congress next fall.

As a result of the organization of the Insulation Board Manufacturers Subcommittee, the Pulp and Paper Section will organize subcommittees for roofing manufacture, paper bags, paper specialties, and paper boxes. It is expected this new procedure will stimulate the interest and activities of the Section.

PRESENTATION OF the National Safety Council's award for first place in group "C" of the Paper Industry Safety Contest for 1949 was presented to the Marathon Corp., Rothschild, Wis., at a dinner meeting of 35 members of the Marathon Foremen's Club held April 25 at the Hotel Marinette. Several other safety awards and citations were presented at the same time.

Ohio Safety Association Holds Election

New officers for 1951 have been elected by the Ohio Paper & Paper Products Safety Association as follows:

Chairman—A. E. Topmiller, Champion Paper & Fibre Co., Hamilton.
Vice Chairman—F. H. Wagner, The Mead Corp., Chillicothe, Ohio
Secretary-Treasurer—G. O. Shibley, Ohio Box Board Co., Rittman, Ohio
Member of Executive Committee—C. A. Walters, Gardner Board & Carton Co., Lockland, Ohio

Employer's Mutual Presents Safety Trophy to Thilmany

A celebration was held recently by 80 employees of Thilmany Pulp & Paper Co., Kaukauna, Wis., in honor of 335 consecutive days, or 2,288,102 man-hours, without a single lost-time accident. In recognition of this achievement, Employer's Mutual, Wausau, Wis., presented a bronze trophy to the company which was accepted by Frank Ferrige, president of the Thilmany Foreman's Club. Special key chains were presented at the same time to all Thilmany employees for their part in the record.

Much credit for the record goes to Clifford Kemp, safety director, and Lester Smith, personnel director, for their work in the mill's safety program. Mrs. Hazel Leedke, chief nurse, also deserves generous credit, as do the foremen, supervisors, and safety committee members.

Growing Number of Mills Participating In Safety Contest

The Paper Industry Contest for the year 1950 shows 421 paper and pulp mills and converting plants participating as of April 30.

Of the 334 reports so far received for the month of April, 186 show perfect scores, and 102 participants have operated the first four months of the contest with a perfect record.

A "WAR ON WASTE" PROGRAM emphasizing safety has resulted in an unusually fine safety record at Manistique Pulp & Paper Co., a Manistique, Mich., division of The Mead Corp. Placing the Manistique mill fourth among the fourteen divisions of the corporation, employees have achieved a 12-month period with only one lost-time accident.

SYMBOL of
HIGHEST QUALITY

B. F. PERKINS & SON, Inc.

ENGINEERS AND MANUFACTURERS

HOLYOKE, MASS.

LARGEST MANUFACTURERS OF CALENDER ROLLS IN THE WORLD

The Paper Industry Association News

Superintendents Ass'n Pa.—N.J.—Dela. Div. Holds Spring Meeting

More than 200 members and guests attended the annual spring meeting of the Pennsylvania-New Jersey-Delaware Division of the Superintendents Association, held at the Yorktowne Hotel, York, Pa., May 5 and 6.

The two-day program opened with a plant visit to the mill of P. H. Glatfelter Co., Spring Grove, Pa., where guides conducted visitors through the plant.

Two papers were presented during the morning session on May 6. William Rice, chemical engineer, P. H. Glatfelter Co., chose as his subject Curl Problems, while Arthur J. Haug, Scott's technical director, spoke on Technical Control of Mill Production. Each paper was followed by a discussion period. Elmer Mitchell, Glassine Paper Co., and Joseph Paciello, E. I. duPont deNemours & Co., Inc., were in charge of this meeting.

At the joint luncheon F. R. Cadman, industrial relations manager, Warner Co., Philadelphia, discussed Keep the Employees in the Know, emphasizing the use of house organs for such work.

The afternoon session May 6 was a discussion and paper by Thomas E. Brookover, chemist, Dowingtown Paper Co., concerning The Paper Industry and Stream Pollution. George Suydam, Riegel Paper Corp., and John Harper, Dowingtown Manufacturing Co., were in charge of this session.

Social activities during the two-day meeting included a buffet supper served by the Glatfelter firm at Glatco Lodge the evening of May 5, and a community breakfast May 6. A cocktail party and dinner May 6 was followed by community singing and dancing.

Host of Glatco Lodge with guests from the meeting of the Pennsylvania-New Jersey-Delaware Division of the Superintendents Association: Front Row (L to R)—O. W. Callighan, Edgar Bros. Co.; Miss Vere M. Brady, Paper Mill News; Harry E. Weston, associate secretary-treasurer of the Superintendents Association; Mrs. Alice R. Dow, secretary of the Division; Glen T. Renegar, chairman of the Division; P. H. Glatfelter, P. H. Glatfelter Co., the host; Henry D. Schmidt, Schmidt & Ault Paper Co.; R. G. Macdonald, national secretary-treasurer of TAPPI. Rear (L to R)—P. H. Glatfelter III, P. H. Glatfelter Co.; Henry Perry, Paper Trade Journal; Andrew Luettgen, Glatfelter Co.

Talk on Alaska and Elections Feature Ohio TAPPI Meeting

The final meeting of the Ohio Section of TAPPI for the current season was held at the Manchester Hotel, Middletown, Ohio, May 11, with 174 members and guests in attendance.

Chairman Arthur Thurn, who presided, introduced as guests: K. C. Geohegan, vice president of TAPPI; John Davis, TAPPI Executive Committee; Dr. Krofta, Black-Clawson representative for Italy, and D. Fogoilio, Fogoilio Paper Co., Milano, Italy.

Mr. Thurn then expressed the appreciation of the Section for the generosity of Shartle Bros. Co. in sponsoring the cocktail hour; he also thanked Wm. Biven, of the Cincinnati Rubber Co. for cigars and Mark Magnusson, of Titanium Pigment Co. for the lapel cards.

A special feature of the meeting was a talk on Alaska by Dr. R. J. Anderson of the Battelle Memorial Institute.

New officers elected at the meeting were:

Chairman—Don J. Goodman, Sorg Paper Co.

Vice Chairman—H. A. Smith, Mead Corp.

Treasurer—R. D. McCarron, Stein, Hall Co.

Corresponding Sec'y—Paul Clark, Crystal Tissue Co.

Recording Sec'y—M. G. Lyon, Champion Paper & Fibre Co.

NEW OFFICERS of Ohio TAPPI are shown seated: (L to R) Malcolm Lyon (Champion Paper & Fibre Co.), recording sec'y; Paul Clark (Crystal Tissue Co.), corresponding sec'y; Donald Goodman (Sorg Paper Co.), chairman; Robert McCarron (Stein, Hall), treasurer; and Herbert Smith (Mead Corp.), vice chairman. Standing are: (L to R) S. R. Holmes (Gardner Board & Carton), John Davis (Mead Corp.), national Exec. Committee, TAPPI; Ken Geohegan (Howard Paper Mills), national vice pres. TAPPI; Arthur Thurn (Champion Paper & Fibre Co.), retiring chairman; and Phil Cade (Harding Jones Paper Co.). Messrs. Holmes, Thurn and Cade are members of the Section's Executive Committee. Other members not in picture are Carl Roess (Wrenn Paper Co.), and D. M. Yost (Sorg Paper Co.)

LEPCA Re-Elects Officers

Sixty members and guests were present for the regular monthly meeting of the Lake Erie Papermaker's and Converter's dinner meeting held April 21 at the Hickory Grill in Cleveland.

Present officers and executive committee of the group were nominated for re-election to office. The chairman of the Miami Valley Division of the Superintendents Association, Kon Matchuk, was a special guest at the meeting.

Limiting his talk to paper and paper products that are used in packaging of food products, the evening's speaker, Loren B. Sjostrom, head of the flavors and odors group of Arthur D. Little, Inc., discussed "Odors in Relation to Paper Products and Packaging." Mr. Sjostrom stressed the fact that paper need not have objectionable odors if proper precautions are taken to prevent them, and emphasized the importance of odor-free paper for food packaging.

NEW OFFICERS were elected at the April meeting of the Lake Erie Papermaker's and Converter's Association. Shown here are: Art Cheeley (left) of Hankins Container, who announced the nominations of Bob Leaf, Ohio Boxboard, for recording and corresponding secretary; Bill Manor, Consolidated Paper, for 1st vice chairman; Bill Schoenber, Lord and Schoenberg for secretary-treasurer; Lew Burnett, Ohio Boxboard, for chairman; and Dave Cooper, Buckeye Ribbon and Carbon, for the executive committee.

Lagerloef Succeeds Amos as SAPI Officer

New secretary-treasurer of the Salesmen's Association of the Paper Industry is Eric Lagerloef, administrative assistant in the APPA. This appointment was effected by a membership committee composed of Ted Lyman, George Watson, Worthy Dodd, and Glenn Amos.

Mr. Lagerloef succeeds E. G. Amos, who, because of expanded duties and advancement in the American Paper and Pulp Association, could no longer serve SAPI in an official capacity (Cf. P. I. April, 1950).

Western N.Y. TAPPI Holds Annual Election

The annual election of officers was a feature of the May 10 meeting of the Western New York Group of the Empire State Section of TAPPI, held at the Prospect House in Niagara Falls, N. Y. Principal officers elected were I. V. Earle, Upson Co., Lockport, N. Y., president; Gordon Storin, Niagara Alkali Co., Niagara Falls, N. Y., vice chairman; Fred Heil, Lockport Felt Co., Newfane, N. Y., secretary; and C. S. Taft, International Paper Co., Niagara Falls, N. Y., treasurer.

A panel of five germicide suppliers including I. A. Clausen, National Aluminate Corp., Hamburg, N. Y.; R. B. Martin, Wallace and Tiernan Co., Newark, N. J.; W. D. Stitt, Buckman Laboratories, Memphis, Tenn.; H. J. Wilhoyte, Grasselli Chemicals Department, E. I. duPont de Nemours, Wilmington, Del.; and R. S. Shumard, Monsanto Chemical Co., St. Louis, presented a program on "Slime Control in the Pulp and Paper Industry." Moderator for the panel, in which each of the five representative members discussed some phase of slime control, was J. J. Forsythe, International Paper Co., Niagara Falls, N. Y.

Dr. J. S. Reichert, duPont Co., presided over the meeting.

Chicago TAPPI Holds Last Meeting of Season— New Officers Elected

Highlights of the season's last regular monthly meeting of the Chicago Section of TAPPI, held May 15 at the Chicago Bar Association in Chicago, included several speakers in discussions concerning adhesives, the surprise attendance of R. G. Macdonald, TAPPI national secretary-treasurer, and the announcement of the results of balloting for 1950-51 local officers.

Mr. Macdonald gave a short talk following his introduction to the group; other speakers in the adhesives panel included Roger Shoals, manager of the adhesives department, Stein-Hall and Co., Inc., who discussed vegetable adhesives for packing machines and future adhesive requirements for speed packaging; Samuel Shuller, technical director, Paisley Products, Inc., who talked on animal glues; and R. L. Pett, resin technical service of the National Adhesives Division of National Starch Products, Inc., whose subject was synthetic resins and the latest developments in the resin field. These authorities led a question and answer period following their talks.

As a result of the balloting held before the meeting, retiring chairman George A. Zinkil, Container Corporation of America, saw the secretary of his term, A. K. Roach, William H. Welsh Co., Inc., named chairman for 1950-51. Other officers elected were Robert Reagan, Chicago Carton Co., vice chairman; Arthur Duetsch, Container Corporation of America, secretary; and Charles Krebs, Atlas Boxmakers, Inc., treasurer.

A RECENT ELECTION OF the National Conference Board, Inc., made Thomas Robins, Jr., president of Hewitt-Robins, Inc., a board member designate of the association, to represent the Rubber Manufacturers' Association. Eleven other New York business men were re-elected to the board.

Coming Events

June 19-22—1950 Chemical Conference, Chemical Institute of Canada, at the Royal York Hotel, Toronto.

June 23-24—Joint Meeting of New England and Maine-New Hampshire sections of TAPPI, at Wentworth-by-the-Sea, N.H. Headquarters will be anounced later.

Aug. 7-20—First United States International Trade Fair, to be held in Chicago.

Sept. 5-9—Sixth National Chemical Exposition by Chicago Section of the American Chemical Society, at the Chicago Coliseum.

Sept. 11-23—Sixth Educational Graphic Arts Exposition, to be held at the International Ampitheatre, Chicago.

Sept. 13-15—Second TAPPI Testing Division Conference, to be held at Eastman Kodak Co. plant, Rochester, N.Y.

Sept. 15-16—Annual Fall Meeting of Northwestern Division of the Superintendents Association, at the Schroeder Hotel, Milwaukee, Wis.

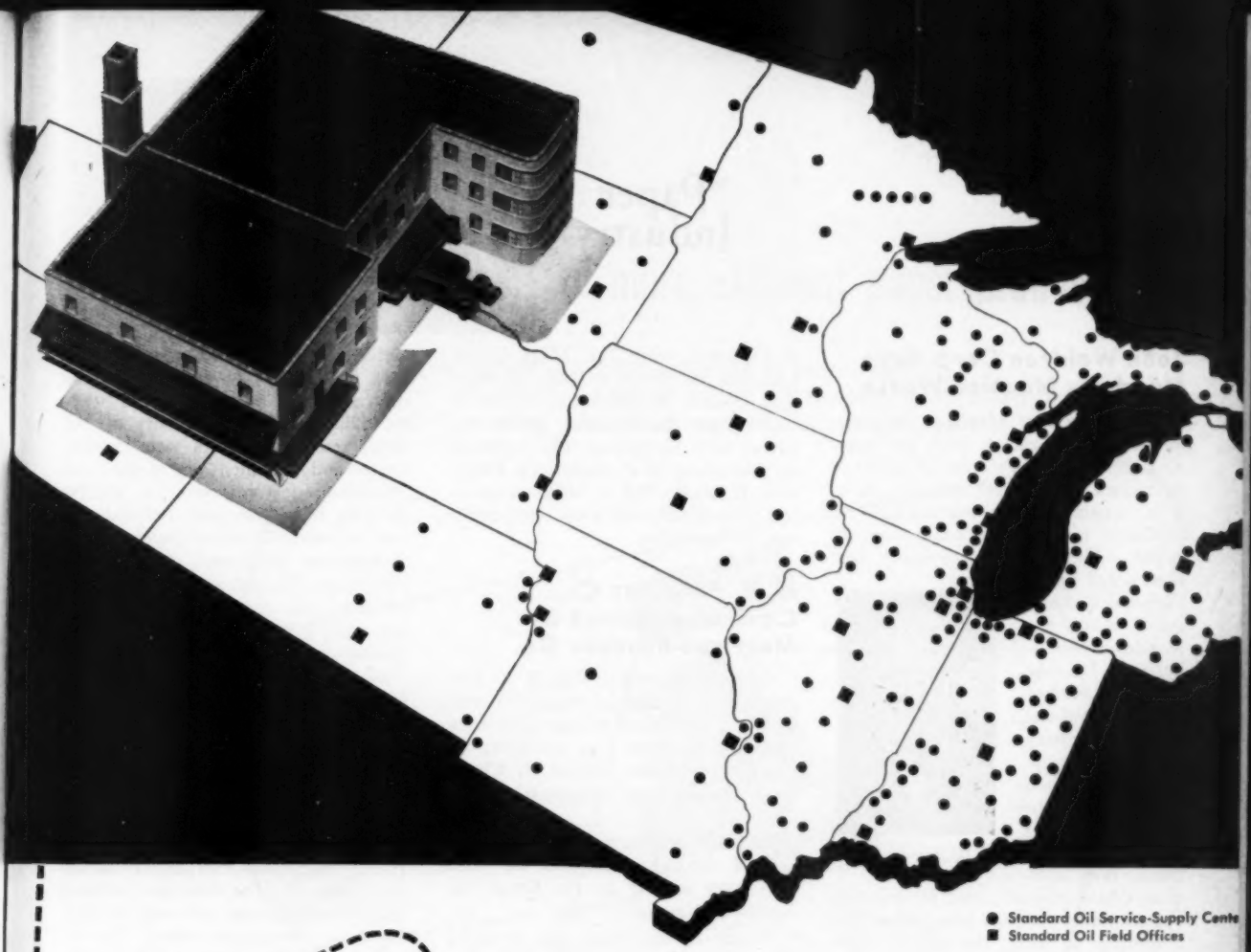
Sept. 18-22—Fifth annual Instrument Conference and exhibit, sponsored by Instrument Society of America, Memorial Auditorium, Buffalo, N.Y.

Oct. 2-5—Fifth annual TAPPI Engineering Conference, Netherlands Plaza Hotel, Cincinnati, O.

Oct. 16-20—38th Annual Congress and Exposition of the National Safety Council, Stevens Hotel, Chicago.

Oct. 25-27—Alkaline Pulping Conference of TAPPI, at George Washington Hotel, Jacksonville, Fla.

Nov. 12-13—Fibrous Agricultural Residue Conference of TAPPI, at Peoria, Ill.



● Standard Oil Service-Supply Cents
■ Standard Oil Field Offices

Right in your own back yard!

● If your plant is in the Midwest, you can benefit from a service-distribution set-up that is unique in the oil industry—there's a Standard Oil office and warehouse practically right in your own back yard. The nearness of that service-supply center holds important advantages for you.

Faster Deliveries. You needn't worry about production delays caused by late shipments of necessary lubricants and fuels. You can avoid the expense and trouble of stocking large quantities of lubricants and fuels within your plant.

A Complete Supply. Every lubricant and fuel necessary to the efficient operation of your plant will be carried in the warehouse at your nearby Standard Oil service-supply center. You can always get the product you need *when* you need it.

On-the-Spot Engineering Service. Your nearby Standard Oil service-supply center is headquarters for a Standard Oil Lubrication Specialist who is assigned to your plant. He is close at hand to give you help when you need it. He has plenty of practical experience. He has been specially trained for his job in a Standard Oil Lubrication Engineering School. He is backed by Standard Oil's extensive research and technical facilities.

To arrange for his visit, phone your nearby Standard Oil service-supply center or write to: Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

3 IMPORTANT ADVANTAGES

Standard Oil's Lubrication Service is especially geared to serve your midwest operations.

1 **Service-supply points** are near your plant. You are assured of fast deliveries, prompt lubrication engineering service.

2 **Lubrication specialists** have been specifically trained in Standard Oil Lubrication Engineering Schools to help you obtain the maximum benefits from lubricants and fuels.

3 **Research and technical facilities** are geared to help solve your specific lubrication problems.

STANDARD OIL COMPANY (INDIANA) STANDARD

The Paper Industry Allied News

John Waldron Corp. Buys Meadows Machine Works

The business of Meadows Machine Works, South Kearney, N.J., has been acquired by John Waldron Corp., New Brunswick, N.J. Both concerns have been engaged in the manufacture of machines used in the converting of paper. The Waldron company has been noted for its high-speed equipment, while the Meadows firm is known for its packaged line of coating, embossing, laminating and similar equipment, designed and built for the medium duty types of operations. Both companies have manufactured reverse roll coaters under the Waldron patents for a number of years; the present combination enlarges the line of designs available for special work.

Wm. J. Cullen

As the result of negotiations brought about so that both firms may benefit from greater centralization of machine design, building, selling and servicing facilities, the John Waldron Corp. has acquired all patents, drawings and good will of Meadows Machine Works, and William J. Cullen, founder and general manager of Meadows Machine Works, has joined the Waldron organization in an official capacity. Under the new set-up, Meadows machines will now be built in the Waldron plant at New Brunswick.

A. O. Smith Corp. Now Owns Whirl-A-Way

The electric motor manufacturing facilities of A. O. Smith Corp., Milwaukee, Wis., will be expanded at Tipp City, Ohio, where the company recently purchased the Whirl-A-Way Motors, Inc., plant. Purchase of the Ohio concern followed a move in February in which the Smith company contracted with Whirl-A-Way for the manufacture of fractional horsepower motors to its specifications.

The Tipp City operation now becomes the eastern motor division of A. O. Smith, with D. L. Mills, former president of Whirl-A-Way, as manager. A new 60,000 sq. ft. factory is to be built this summer, which, together with equipment will represent an investment of approximately $500,000. It is expected to begin construction this month with production under way by September.

H. K. Ferguson Co. Control Acquired by Morrison-Knudsen Co.

Controlling stock of The H. K. Ferguson Co., industrial engineers and builders, Cleveland, was purchased by Morrison-Knudsen Co., according to an announcement released in Cleveland by the two organizations on May 19.

Morrison-Knudsen Co. has acquired control through acquisition of stock previously owned by the Oman interests of Nashville, Tenn.

Terms of the stock sale involved "several million dollars." The management, personnel, and policy of the company will continue without change. Otto F. Sider will remain executive vice president and general manager.

Nat. Starch Acquires Formulas and Mfr. of Arnold Hoffman Dextrines

Final negotiations have been completed for the transfer of all formulas, manufacturing procedures and dextrine accounts of Arnold, Hoffman & Co., Inc., Providence, R.I., to National Starch Products, Inc., New York.

Arnold, Hoffman & Co. chose to dispense with dextrine operations since they are now concentarating most effort in dye stuffs and allied fields. National Starch products is now a leading starch manufacturer and processor in a position to carry on the high standards of quality maintained by Arnold & Hoffman in the past 135 years.

American Cyanamid Labs. Opened to Visitors

The Stamford Research Laboratories of American Cyanamid Co., Stamford, Conn., were recently opened to the public for the first time since their establishment in 1936. At an open house held for families of employees, business men, and members of the press, the full extent and diversity of the firm's research facilities were demonstrated and explained; one of the more interesting features was an exhibit showing how Cyanamid chemicals are used by manufacturers of paper.

American Cyanamid, founded in 1907 to produce calcium cyanamide for fertilizer, has expanded and diversified until it now provides research facilities contributing to several thousand products sold to 200 industries. Studies on wet-strength papers now require a separate laboratory, as does work on chemicals for paper.

GENERAL HEADQUARTERS staff and facilities of American Can Co. in New York have been moved from 230 Park Avenue to the 100 Park Avenue Building at 41st St. The move also included the Atlantic division sales and the Metropolitan sales organizations. The telephone number—Murray Hill 6-4900—remains unchanged.

REDEMPTION OF $40,000,000 of the $80,000,000 issue of 2.65 per cent debentures due Westinghouse Electric Corp. on July 1, 1973, has been authorized for July 1, 1950. Debentures will be selected by lot and redeemed at 104 per cent of the principal amount, plus accured interest. Notice of those selected will be published at least 30 days before they are called.

NEWLY LOCATED IN the McGraw-Hill Building at 330 West 42nd St. are the New York offices of the United States Testing Co., Hoboken, N.J. The new offices, formerly at 1450 Broadway, will be under the management of Thomas C. Ridgway.

PROMPT SERVICE TO industry and scientific and educational institutions in the Seattle area will be facilitated by Leeds & Northrup Co., Philadelphia, with the opening of a new sales and service office there. Supplementing the company offices at San Francisco and Los Angeles and warehouses at Los Angeles, the new center will serve Washington, Oregon, Idaho, and Brit-

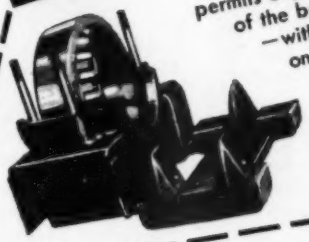
TRAIL BLAZERS to more efficient paper production

Four important developments in paper-making efficiency—some of which are becoming standard practice with bearing manufacturers, *originated with* **SKF**.

THE FIRST

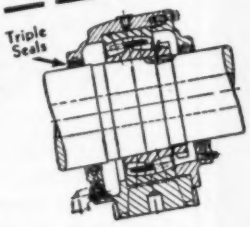
Spherical Roller Bearings applied to paper machinery, with results of smoother paths for power and real operating economies, were SKF Bearings.

THE FIRST



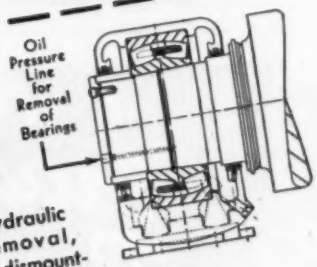
Rocker Mount Design, which permits expansion and contraction of the bearings and driers —with no lateral stresses on the side frames, was an SKF development.

THE FIRST



Triple Seals, for efficient non-rubbing sealing that retains lubricant independent of speed and temperature, were designed by SKF.

THE FIRST



System for Hydraulic Bearing Removal, where such dismounting of large or small bearings becomes a rapid and easy operation that eliminates damage to bearing and housings, was originated by SKF Engineers.

SKF

BALL AND ROLLER BEARINGS

Yes, SKF, in the paper industry as well as many others, has blazed the trail to more efficient, economical, reliable production. And right now, SKF Engineers in cooperation with machinery builders are *anticipating* the needs of advanced designs of paper machinery — so that years from now production will be even more efficient. **SKF** INDUSTRIES, INC., PHILADELPHIA 32, PA., *the Pioneers of the Deep Groove Ball Bearing—Spherical Roller Bearing—Self-Aligning Ball Bearing.* 7100

8 REASONS WHY **SKF** IS PREFERRED BY ALL INDUSTRY

Integrity — Craftsmanship — Metallurgy — Tolerance Control

Surface Finish — Product Uniformity — Engineering Service — Field Service

ish Columbia. Stratford B. Biddle, Jr., manager; and Ira F. Omwake, Jr., are in charge of the new offices at 603 Stewart St.

AN ELECTRON MICROSCOPE has been installed by United States Testing Co., Inc., Hoboken, N.J. With the electron microscope, which has a resolving power far greater than any light microscope, specimens having diameters of less than one-half the wavelength of light, may now be resolved. The Microscopy Department of the firm is under the direction of Arthur Coe.

ESTABLISHMENT OF offices in New York City has been announced by Abe Cooper, president of Bagley & Sewell Co., Watertown, N.Y. Located at 500 Fifth Ave., the new offices will be in charge of Joseph S. Scheuermann, vice president of the converting equipment division of the firm. The New York office will aid in extending the general sales and services of the firm.

ARCHITECT'S DRAWINGS for a new applied research laboratory to be built at Avon Lake, Ohio, for B. F. Goodrich Chemical Co., have been completed. The new laboratory, a one story building with an extensive window expanse, will be the third unit in the company's multi-million dollar building program in the Cleveland area. A general chemicals plant and a semi-works plant have already been completed and are in production.

SET THE PACE FOR 1950 was theme of a three-day general conference conducted for the sales staff of Dicalite Division, Great Lakes Carbon Corp., at the Edgewater Beach Hotel in Chicago on April 19. Present at the dinner which concluded the conference were: Seated (L to R)—S. A. Burkland, Jr.; J. E. Moran; H. L. Walker, Jr.; A. R. Bollaert; J. W. Meader; and R. W. Blunt

AN ADVERTISING AND public relations office has been opened in Cleveland by John Yezbak, for the past seven years director of public relations of The Timken Roller Bearing Co., Canton, Ohio.

FINAL ARRANGEMENTS HAVE been completed for the organization of Mathieson Hydro-carbon Chemical Corp., a $27,000,000 joint venture of Mathieson Chemical Corp., Baltimore, and the shareholders of Tennessee Gas Transmission Co., of which Gardiner Symonds, Houston, Texas, is president.

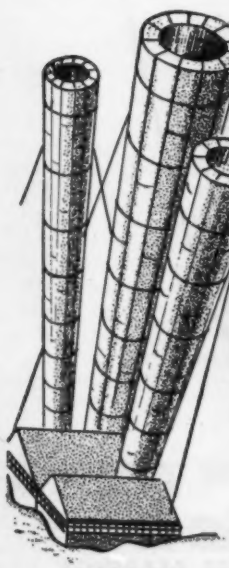
A SHUTDOWN at the Lindsay Wire Weaving Co., Cleveland, has come to an end after 50 days. Full-scale operation and production will be resumed as soon as possible, and customers' orders filled as promptly as possible.

PURCHASE OF Briggs Filteration Co., Washington, has been completed by Bowser Co., Fort Wayne, Ind. Purchase price paid by the pump manufacturer has not been announced. Fred S. Ehrman, formerly vice president in charge of Bowser's filtration division, will become president of Briggs. An annual sales volume of $750,000, with current operations at a profit, is announced for the Briggs firm.

A MANUFACTURING DIVISION has been formed by Process Industries Engineers, Inc., Pittsburgh. The new division will accommodate demands for fabrication of specially engineered equipment for chemical and allied industries, while sales and engineering divisions will continue to be operated at 5941 Baum Boulevard.

MORE PROMPT AND effective service to industries in northern New York state will be possible by Westinghouse Electric Corp., Pittsburgh, with the establishment of a new office in Watertown, N.Y. Richard E. Fang, formerly a salesman in the Rochester territory, will be transferred to maintain the Watertown offices.

NEW ADDRESS OF the Cleveland district sales offices of Heppenstall Co., Pittsburgh, is 506 Terminal Tower Building. R. E. O'Briene remains as district sales representative for the firm, formerly located at 311 Rockefeller Building.



A WOOD
Naturally Resistant
TO ACIDS, ALKALIES AND DECAY

Tidewater
RED CYPRESS

Tidewater Red Cypress serves better and lasts longer. It's natural resistance to acids, alkalies, etc. insures long and satisfactory results when used in vent stacks, pickling troughs, electroplating vats, etc. It's use under these conditions truly confirms its claim to being "The Wood Eternal".

If you have a particularly perplexing problem let us help you solve it. We invite inquiries concerning all types of tanks and vats . . . fully fabricated or partially fabricated.

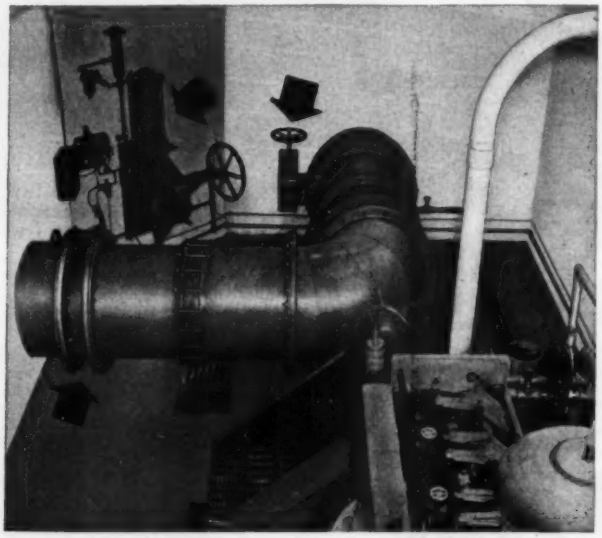
The Water Red Cypress "The Wood Eternal"

FLEISHEL LUMBER COMPANY

4234 Duncan Ave., St. Louis 19, Mo., NEwstead 2100

R-S valvEvents

• EXCERPTS FROM THE R-S BOOK OF EXPERIENCE •



TULSA WATER SUPPLY

Increased in Record Time

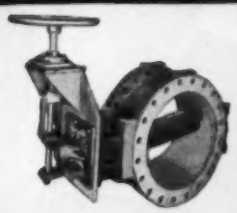
The City of Tulsa Water Department increased its water supply from twenty-four to minimum requirements of thirty-five million gallons a day without constructing a second gravity flow line. This was accomplished by means of booster stations at strategic points.

The fifteen R-S Valves supplied for this emergency operation ranged in size from 36-inch handwheel operated to 60-inch air cylinder operated with handwheel declutching units. After delivery, these valves were slipped into the line in a matter of hours. The entire project was completed in remarkably fast time.

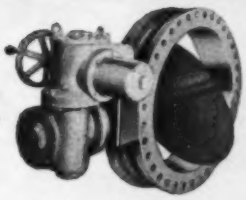
Due to an improvement in vane design, the flow rate in R-S Heavy Duty Valves (12-inch and larger) has been increased approximately 25% in the wide open (77½°) position. In case after case, the saving in pumping (or blower) costs will pay for an R-S Valve in short order based on "K" values alone.

Consult with your local R-S Valve Engineers. Look for the address and phone number listed under "R-S Products, Valves" or write direct.

R-S PRODUCTS CORPORATION
Wayne Junction • Philadelphia 44, Pa.

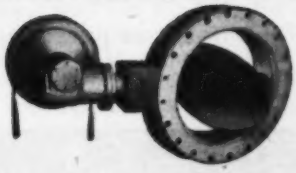


No. 700—20-inch 50-pound Cast Iron Valve with rubber seat, Type B-8934, for positive 100% shut-off. Heavy duty handwheel control with threaded reach rod. Type B-9469.

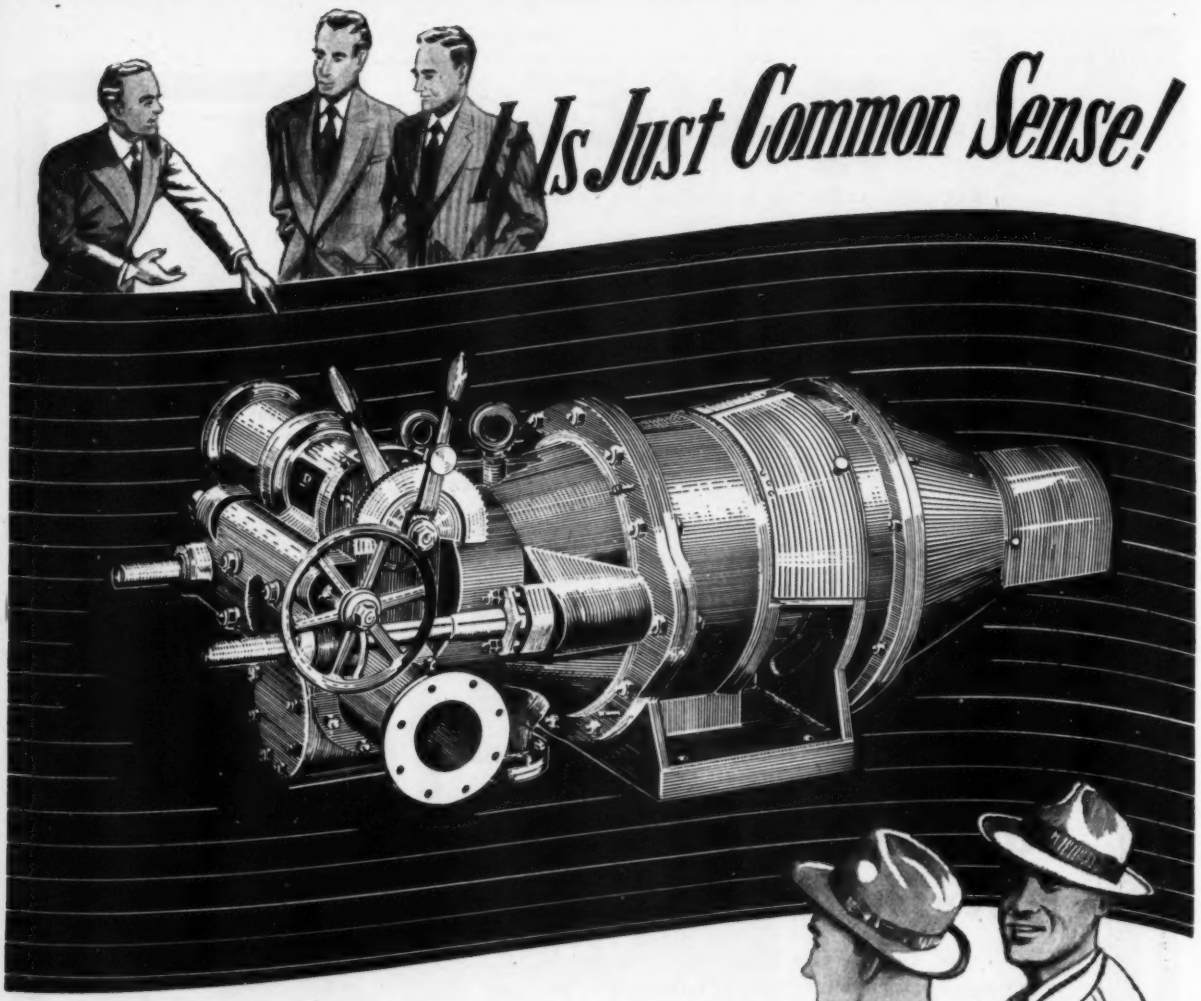


No. 724—42-inch 50-pound Heavy Service Valve, B-9813, complete with limitorque motor and gear reduction drive No. 4. Angular seating vane for wedge-type closure with metal seat. Rubber seat available if desired. Valve body good for 125 psi gauge static head and drip tight shut-off at 50 psi pressure drop with rubber seat.

No. 768—66-inch Fabricated Steel Handwheel Operated Valve with ends scrafted for welding. 6½-inch diameter one piece Stainless Steel shaft mounted on thrust bearings (valve installed with shaft vertical). Horizontal and vertical ribs on body prevent distortion when machining and assembling. Stuffing box easily repacked. Used to control river flow during dam construction. Open atmospheric discharge.



No. 737—20-inch 50-pound Heavy Service Valve (B9804) with rubber seat (B8934). Gear reduction drive No. 3 with chainwheel.



It's Just Common Sense!

The way

the Morden "Stock-Maker" combines beating or refining into one simple and continuous operation.

More than 350 "Stock-Makers" in over 100 mills have proven its superiority for the vast majority of stock treatment requirements.

May we assist you in surveying "Stock-Maker's" advantages for your particular requirements?

in Canada
The William Kennedy & Sons, Ltd., Owen Sound, Ontario

in England
Millspaugh, Limited, Sheffield

Eastern Sales Representative: Union Machine Company, Fitchburg, Massachusetts

The Paper Industry Names in the News

Burt Kassing Leaves Ecusta To Go With Nekoosa-Edwards

Former general manager of manufacturing of Ecusta Paper Co., Pisgah Forest, N.C., Burt Kassing, has been named director of process and product development of Nekoosa-Edwards Paper Co., Port Edwards, Wis. Mr. Kassing will co-ordinate the work of the technical and manufacturing departments of the company in planning and developing new products and processes.

Mr. Kassing entered the paper industry after completing both undergraduate and graduate work at the New York State College of Forestry at Syracuse University. His first work was with Hammermill Paper Co., Erie, Pa., where he started as a member of the technical staff, becoming paper mill superintendent in 1933.

In 1945, Mr. Kassing returned to the College of Forestry as a professor of pulp and paper manufacture, at the same time serving as a consultant to several paper mills. He had been with Ecusta since 1948.

Burt Kassing

L. J. Hughlett

Lloyd J. Hughlett Joins Arthur D. Little Co.

The former editor of two McGraw-Hill Publishing Corp. Spanish language engineering publications, Lloyd J. Hughlett, has joined the staff of Arthur D. Little, Inc., Cambridge, Mass. Mr. Hughlett will be engaged primarily in studies leading to programs for regional economic development in his new work.

While with McGraw-Hill International Corp., Mr. Hughlett was editor of *Ingenieria Internacional Industria* and *Construccion;* he was located in Peru with the Cerro de Pasco Copper Corp. before that connection. During recent years, Mr. Hughlett has been active in promoting export of American technical aid to underdeveloped areas, and has worked with various manufacturers interested in expanding their operations in favorable manufacturing climates abroad.

Watzek Made Pres. of Crossett . . . Other Executive Changes

In recent executive elections of Crossett Paper Mills, Crossett, Ark., Peter F. Watzek was elected president of the company, to succeed E. C. Crossett. Mr. Crossett, whose father was the founder of the town, became chairman of the board in the same election. Mr. Watzek, who became vice president and general manager of the firm in 1942, will continue as general manager.

Other executive changes included the promotion of Edwin W. Bird, executive assistant, to manager of the Crossett-owned Fordyce Lumber Co., the appointment of A. B. Moore, assistant superintendent of the paper mills, as executive assistant to succeed Mr. Bird, and the appointment of William E. Hastings as assistant treasurer.

Ryerson Elections

Three changes have been made in the executive personnel of Joseph T. Ryerson & Son, Inc., Chicago. The former vice president and general sales manager, Harold B. Ressler, has been elected first vice president of the firm. Mr. Ressler had held his former position since 1932, with offices in Chicago after 1944.

C. L. Hardy, the former assistant vice president, has been appointed assistant to the company's president, Everett D. Graff. Mr. Hardy has been with Ryerson since 1927, and had undertaken the duties of assistant vice president in 1949.

Thomas Z. Hayward has been appointed general sales manager for the group of thirteen Ryerson steel service plants. Mr. Hayward has spent his entire business life with Ryerson, joining the company in 1917, and holding increasingly responsible positions in the sales department until this time.

R. W. Lull Named Sales-Service Engr. By American Cyanamid

The appointment of Robert W. Lull as West Coast sales-service engineer for the Paper Chemicals Department of the Industrial Chemicals Division of American Cyanamid Co., New York, has been announced. Mr. Lull, who will be located in Portland, Ore., will assist paper mills in the application of chemicals made by Cyanamid for the paper industry.

West Coast representatives of the firm, including Ed Garrison, Seattle; Paul Ochs, San Francisco, and Herb Pratt, Los Angeles, will work with Mr. Lull.

Robt. W. Lull

Gen. Lucius Clay

General Clay Becomes Board Chairman of Continental Can Co.

General Lucius D. Clay, formerly commander of U.S. forces in Europe and military governor of the U.S. Zone, was elected chairman of the board and chief executive officer of Continental Can Co., Inc., at a recent meeting held in the company's executive offices in New York.

General Clay replaces *Carle C. Conway,* who has resigned after having served as chairman since 1930. Mr. Conway will continue to serve Continental Can as a member of the board of directors and chairman of the executive committee.

United Board & Carton Adds Six to Sales Staff

An intensive 16-week training course at the office of United Board and Carton Corp., Syracuse, N.Y., has resulted in addition of six men to the company's

sales staff. This increase resulted from additional business and company expansion.

The men entering this work and the territory assigned are: Wm. L. Knapf, Hartford, Conn.; John F. Casey, New York City; Robert L. Smith, Pittsburgh; Leonard Fendrich, Detroit; Richard M. House and Joseph S. Norton, Chicago.

J. O. Julson Follows Marvin Jones At Springfield, Ore.

Announcement of the appointment of J. O. Julson as manager of the Weyerhaeuser Timber Co. container board plant at Springfield, Ore., has been made by Howard W. Morgan, manager of the firm's pulp division.

Mr. Julson succeeds Marvin C. Jones, who recently resigned the position (Cf. P. I., May, 1950), assuming his new work early this month. Previously, Mr. Julson had been associated with the Diamond Match Co., subsidiary, Berst-Foster-Dixfield Co., Plattsburg, N.Y., since 1933, becoming chief engineer of the paper section in 1942, and general manager of the pulp and paper division in 1945, a position he retained when Berst-Foster-Dixfield and Diamond Match were merged in 1947.

Can. Westinghouse Elects New Officials

Several changes on the executive level were made at Canadian Westinghouse Co., Ltd., in recent board elections. Herbert H. Rogge, a veteran of 28 years in the electrical industry and formerly executive vice president of the company, was elected president and chief executive officer.

Harold A. Cooch, former president, was elected chairman of the board, succeeding John R. Read. Mr. Read has retired after 50 years of service to the company.

Additions and Changes Made In Sales Staff of Union Bag & Paper

Several promotions and an addition to the Corrugated Container Division of Union Bag & Paper Corp. became effective recently. R. Carl Chandler, formerly company sales representative in the Southeastern territory, has been appointed sales manager of the Trenton plant. Mr. Chandler fills the post left vacant by Roy W. Williams, whose company affiliation in the future will be on a consulting and special assignment basis.

John W. Butler, who has been with the firm for three years, has been promoted to Southeastern District sales manager, with headquarters in Atlanta, Ga. His assistant will be the former Chicago area sales representative, Frank P. Grimes.

Robert B. Graves has been appointed to a special sales assignment in the firm's New York office, but will continue in his former capacity of Central Pennsylvania sales representative.

Raymond C. Bowers, who has more than 17 year's experience in the development and sale of corrugated package products, has joined the middle west field sales staff of the firm.

LeRoy and Ewing Promoted by Bemis Bros.

Former head of the paper control laboratory of Bemis Brothers Bag Co., St. Louis, Robert B. LeRoy, has been appointed sales manager of the Bemis multiwall paper bag plant in East Pepperell, Mass. Mr. LeRoy succeeds C. H. Waterous, now on an extended leave of absence.

R. B. LeRoy

A. R. Ewing

Taking Mr. LeRoy's place as head of the paper control laboratory is Arthur R. Ewing, formerly laboratory technician at the Bemis plant in Peoria, Ill., and technical assistant to the superintendent of the paper mill there.

William H. Jennens, associated with Eastman Kodak Co., Rochester, N.Y., for the past 21 years and production supervisor of the firm's paper sensitizing department since 1948, has been named superintendent of the Kodak paper sensitizing department at Kodak Park. Mr. Jennens succeeds William K. Kridel, who retired recently.

Ohio Boxboard Holds Board Elections

The board of directors of The Ohio Boxboard Co., Rittman, Ohio, elected two new officers, and re-elected all others.

Newly-elected vice president of the company, Melvin E. Barthen, has been associated with the firm for the past 15 years, most recently as secretary and administrative assistant to the president. Robert E. Young, elected secretary, has been associated with Ohio Boxboard for the past four years in the finance and accounting division.

New Officials Elected At Puget Sound Pulp And Timber Co.

At the annual meeting of the board of directors of Puget Sound Pulp and Timber Co., Bellingham, Wash., the former executive vice president of the firm, Lawson P. Turcotte, was advanced to the presidency of the company.

Concurrently, Fred G. Stevenot, past president of the company, became chairman of the board in the election in which all other company officers were re-elected.

G. L. DuBois has been appointed southern representative for Kimberly-Clark Corp., Neenah, Wis. From district headquarters in Atlanta, Ga., Mr. DuBois will direct all sales in the area in addition to continuing his former work as manager of book paper sales.

Tom Turner, associated with Westinghouse Electric Corp., Pittsburgh, since 1922, has been elected a vice president. Mr. Turner, whose first work with the corporation was as a machinist, will continue to direct the activities of the Westinghouse Elevator Division at Jersey City, N.J., where he has been general manager since 1948.

L. J. Amsdell has been appointed director of the pipe joint division of Gates Engineering Co., New Castle, Del. Mr. Amsdell came to Gates after eighteen years experience in the sales management field. His new duties will include sales direction of Gates' Gaco Pipe Joint System.

Lee Turley, vice president in charge of sales for McLaurin-Jones Co., Brookfield, Mass., recently was elected to the board of the gummed, coated and specialty papers manufacturing company. Before joining McLaurin-Jones in 1946, Mr. Turley was associated with Nekoosa-Edwards Paper Co., Port Edwards, Wis.

Irving Hefter has been appointed sales manager for the Chicago area by Stone Container Corp., Philadelphia. Mr. Hefter formerly had served the company as sales promotion manager of the Chicago office.

Dr. Geoffrey Broughton, head of the paper engineering department of Lowell Textile Institute, Lowell, Mass., has been granted $1500 by the Research Corporation of New York City, for use in a paper research program at the Institute. Dr. Broughton's recommendation that the grant be used for a study of the behavior of fibers in the papermaking process was accepted by the board of directors of the Research Corporation.

Fred M. Gillies, formerly works manager for Inland Steel Co., Chicago, has been elected to the position of executive vice president of Acme Steel Co., Chicago, left vacant last fall with the election of Chester M. MacChesney to the board chairmanship. Mr. Gillies had been with Inland since 1922.

Robert H. Davies has been elected vice president and general acting manager of Baker Industrial Truck Division of The Baker-Raulang Co., Cleveland. *Edward H. Remde* was elected a vice president at the same time.

Robert H. Evans was elected treasurer of the Riegel Paper Corp., New York, at a recent meeting of the board. Mr. Evans, who was formerly assistant treasurer of the firm, will also serve as secretary.

Executive Changes In Effect at Gardner Board & Carton Co.

Recent elections and appointments at The Gardner Board and Carton Co., Middletown, Ohio, have resulted in the addition of four new board members and a vice president, as well as several executives.

Newly elected to the board are Ames Gardner, associated with the company since 1933; William E. Gardner, who joined the firm in 1940, and is assistant director of the board sales department at present; G. Corson Ellis, a senior partner in the management consultant firm of A. T. Kearney, Chicago; and C. Chester Guy, member of the accounting firm of Murphy, Lanier & Quinn, Cincinnati.

The newly-appointed vice president, Robert B. Gardener, a son of the company's founder, has been active in company business for forty years. Mr. Gardner has been in charge of the board sales department for more than thirty years, and since 1932 has served as assistant secretary of the company. He will continue to direct all activities of the board sales department, but has

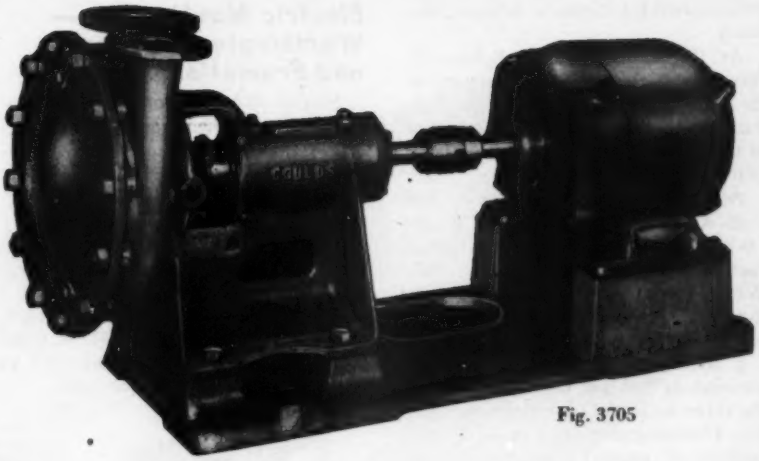


Fig. 3705

For Outstanding Service Handling Corrosive Liquids—

Goulds new stainless steel centrifugals

ADVANCED PUMP DESIGN—

The Goulds 3705 stainless line represents the last word in effective design. Fig. 3705 pumps will give you efficient, dependable, 24-hour service in handling corrosive liquids—at low cost.

CAPACITIES—

Goulds stainless steel centrifugals are made in 8 sizes with capacities to 750 G.P.M. and heads to 180 ft. depending upon capacity.

ADVANTAGES—

Exceptional efficiency (see Bulletin for performance curves) plus extreme simplicity make this an ideal pump for corrosive applications. High interchangeability of parts cuts stocking problem. Quick inspection or cleaning—simply remove casing cover without disturbing pipe connections.

Write for Bulletin 725.3 for complete details on this new stainless steel pump.

MEMBER

Goulds PUMPS INC. Seneca Falls New York

relinquished his duties as assistant secretary.

At the same elections Robert O. Brosius was elected active secretary of the company; in addition to the new duties of that position he will continue to fulfill the duties of his former position as assistant treasurer.

Andrew J. Westendorf, who has been assistant superintendent of the Lockland mill since 1947, was named superintendent of that mill. Mr. Westendorf has been associated with the Gardner organization and its predecessor companies since 1925.

J. Shartle Brookover has resigned his position as general superintendent of the three mills of Downingtown Paper Co., Downingtown, Pa., to accept the position of general superintendent of the Lockland mill. Mr. Brookover's predecessor as superintendent, Herbert L. Niehaus, has resigned the position because of ill health, but will remain with the company as skid department foreman.

David R. Arnold, formerly associated with A. T. Kearney and Co., Chicago management consultants, has been appointed to the controller's staff of the company.

H. G. Ebdon and *William P. E. Ainsworth* have been elected vice presidents of Combustion Engineering-Superheater, Inc., New York. Both will continue in their earlier capacities, Mr. Ebdon as general sales manager of boilers and related equipment, and Mr. Ainsworth as general purchasing agent and production manager.

Merton B. Lilly has been appointed head of the patent department of Wyandotte Chemicals Corp., Wyandotte, Mich. Mr. Lilly, who holds degrees in both chemistry and law, succeeds William R. Day, who was recently promoted to assistant to the company president. (Cf. P.I., May, 1950)

Fred C. Boyce was re-elected president of D. J. Murray Manufacturing Co., Wausau, Wis., at a recent director's meeting at which time all other officers also were re-elected.

William M. Wallace, assistant to the manager of the basic industries department of Allis-Chalmers Manufacturing Co., Milwaukee, has been chosen to participate in the Sloan Fellowship program for executive development at the Massachusetts Institute of Technology. Mr. Wallace will be on a leave of absence while participating in the one-year residence study at the school.

Electric Mach'y Mfg.— Worthington Elections and Promotions

Several management and executive changes have taken place at Worthington Pump and Machinery Corp., Harrison, N.J., and its subsidiary, Electric Machinery Manufacturing Co., Minneapolis.

R. H. Olson, formerly vice president in charge of sales for electric Machinery and associated with the firm since 1919, was elected president of the company. Mr. Olson succeeds W. H. Feldmann, who went to Worthington as vice president in charge of sales.

Mr. Olson's successor as Electric Machinery sales vice president is A. P. Burris, former manager of the New York sales district who has been associated with Electric Machinery since 1930. P. L. Shawley, of the New York office, has been promoted to manager of the New York district sales office.

The new assistant to the Worthington president is Charles A. Butcher, formerly general manager of Crocker-Wheeler Electric Manufacturing Co., and vice president of its successive parent firms, Joshua Hendy Corp., and Elliott Co. Mr. Butcher will make his headquarters in New York.

R. H. Olson

A. P. Burris

P. L. Shawley

Grant Stinchfield, who has been active in sales since 1939, has been appointed general sales manager of Doeskin Products, Inc., New York. Mr. Stinchfield will make his headquarters in New York.

S. F. Allison has been appointed corrugated sales manager for Rittman Sales of The Ohio Boxboard Co., replacing *Marc Shofer* who resigned May 1. Mr. Allison joined the firm six years ago, and has served as assistant sales manager for three years.

Vance Edwardes, associated for many years with the International Paper Co., New York, has joined R. S. Aries and Associates, Brooklyn, N.Y., consulting firm, as a senior associate. Mr. Edwardes is a former president of TAPPI.

J. A. Herring, associated with the Naugatuck Chemical Division of United States Rubber Co., New York, has been appointed technical sales representative for Marvinol vinyl resins in the New York City area.

J. M. Floyd, formerly vice president in charge of manufacturing for the A. C. Smith Corp., Milwaukee, has been named executive vice president of the company by action of the board of directors. In his new position, Mr. Floyd, who has been with the Smith company since 1936, will be in charge of general operating supervision of the company under the general direction of the president.

Harold Crabtree was recently appointed director and board chairman of Donnacona Paper Co., Ltd., Donnacona, Que.; other appointments included those of E. Howard Smith as a director and vice president and J. Edouard Simard as a director.

Don Hall, New England representative for Eastwood-Nealley Corp., Belleville, N.J., has been confined to the hospital for several weeks, but he will shortly resume his visits to New England paper mills for the firm.

Gene D. Sickert recently was appointed works manager of the Indianapolis plant of the Peerless Pump Division of Food Machinery and Chemical Corp. Mr. Sickert had held a similar position with the Bolens Product Division of the company for the past four years.

John P. Edwards has been named supervisor of product application for Hooker Electro-chemical Co., Niagara Falls, N. Y. In his new work Mr. Edwards will co-ordinate activities of research and sales along the lines of developing uses for new products and new applications of old products. Mr. Edwards, since joining the Hooker

Murco STAINLESS STEEL FLAT SCREEN

ALL PARTS IN CONTACT WITH PAPER STOCK are STAINLESS STEEL

FOR use on either Fourdrinier or cylinder machines, this improved MURCO Stainless Steel Flat Screen is particularly adaptable for running different colors and grades of paper and boards—any operation where cleaning and preparing the screen for the next run demands no loss of time.

The upper part, or plate section of the vat can be removed in its entirety and replaced easily with a spare section instead of taking up the plates.

The corners are rounded, so they are free from anything which might cause hanging up of fibres.

An exclusive feature of the MURCO Stainless Steel Flat Screen is the non-tip diaphragm actuating mechanism. Diaphragms are designed to be easily removed without disturbing the other parts.

The efficiency and quiet operation of this screen in its entirety have proven surprising to mill men wherever installed. Another advantage is the absence of the necessity for painting—and its always neat appearance.

These features with high production, but low Hp requirements are reasons for you to investigate the MURCO Stainless Steel Flat Screen . . . ask for details today.

VAT BOX MAY BE TILTED FOR RAPID CHANGE OF SCREEN PLATES AND WASHING OUT!

D. J. MURRAY MANUFACTURING CO.

MANUFACTURERS SINCE 1883

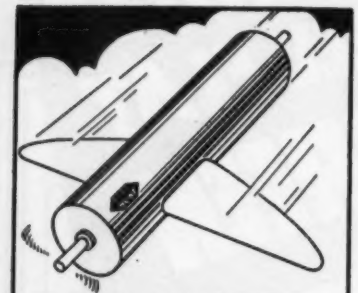
WAUSAU WISCONSIN

firm upon his graduation from the University of Minnesota in 1940, has worked with the process study group and sales development department.

Marshall E. Cusic, formerly assistant sales manager of the Rex Chain and Transmission Sales Department of Chain Belt Co., Milwaukee, has been named a district sales engineer. Mr. Cusic, who will make his headquarters in the firm's Pittsburgh district office, has been part of the Chain Belt organization since 1937.

R. E. (Bob) Stevens, formerly mill manager of Angelus Paperbox Co., Los Angeles, has retired from that position. Mr. Stevens, who was instrumental in the original formation of the Angelus firm four years ago, will remain with the company in an advisory capacity for some time.

Thomas Whelan, Jr., has been appointed sales manager for the Houston, Texas, office of The Patterson Foundry & Machine Co., East Liverpool, Ohio. Mr. Whelan will have his headquarters at 2405 San Jacinto St., Houston (4). Formerly, he was with C. F. Braun Co. in the design and sale of processing equipment.



FAST DELIVERY ON "SHAF-TITE" ROLLS

FOR WET FELTS

plus patented features that give greater value.

Write for Catalog!

RODNEY HUNT MACHINE COMPANY

38 Maple Street, Orange, Mass., U.S.A.

William E. Soles has been nominated as a director of Anglo-Canadian Pulp & Paper Mills Ltd., Quebec City, Quebec.

Paul H. Kiernan has been retained as assistant to the director of industrial relations for Union Bag and Paper Corp., New York. Mr. Kiernan, whose former affiliation was with the Bigelow-Sanford Carpet Co., Amsterdam, N.Y., will be responsible for Union Bag's home office personnel program and staff corporate industrial relations work.

Arthur H. Brodie, formerly associated with International Equipment Co., Toronto, has been appointed district manager of the Chatham, Ontario, plant of Tube Turns, Inc. Mr. Brodie joined Tube Turns of Canada in March.

Ervin J. Bookout has been appointed eastern sales manager of Cochrane Corp., Philadelphia. Mr. Bookout has been associated with Cochrane for many years, serving as a sales engineer in the Philadelphia area subsequent to work in the laboratories.

The Paper Industry Necrology

Dr. Hugh P. Baker

Prominent educator and president emeritus of the University of Massachusetts, Dr. Hugh Potter Baker passed away May 24 at Orlando, Florida. He was 72 years of age.

Dr. Baker was born in St. Croix Falls, Wis., and was a graduate of Michigan State College. A pioneer in forestry education, he established the New York State College of Forestry at Syracuse where he served as dean from 1912 to 1920 and again from 1930 to 1932. He also assisted in establishing forestry schools in Iowa and Pennsylvania. He once filled the position of professor of forestry at Iowa State College.

Dr. Baker was executive secretary of the American Paper and Pulp Association from 1920 to 1928.

He is survived by the widow, a son, and a brother, Ray Stannard Baker, author, widely known as David Grayson.

A. Sidney Keller, vice president of Chicago Metal Hose Corp., Maywood, Ill., passed away May 8, at the age of 52. Mr. Keller, who was a veteran of World War I, is survived by his widow.

D. Aubrey Halgren, sales manager of Blake, Moffitt and Towns, Seattle, Wash., passed away April 1, at 55 years of age. Mr. Halgren had been a salesman for the firm since 1930, and had served as sales manager for the past six years. The widow survives.

Wilbur F. Pray, New York district sales manager for Askania Regulator Co., passed away April 16 at the age of 50. Mr. Pray had been with Askania since 1922. His widow and one daughter survive.

Alphonse O. Rousseau, well known authority on grinding wheel safety, passed away March 27, at the age of 61. Mr. Rousseau, associated with Norton Co., Worcester, Mass., for 43 years, had last served the company as abrasive products safety engineer.

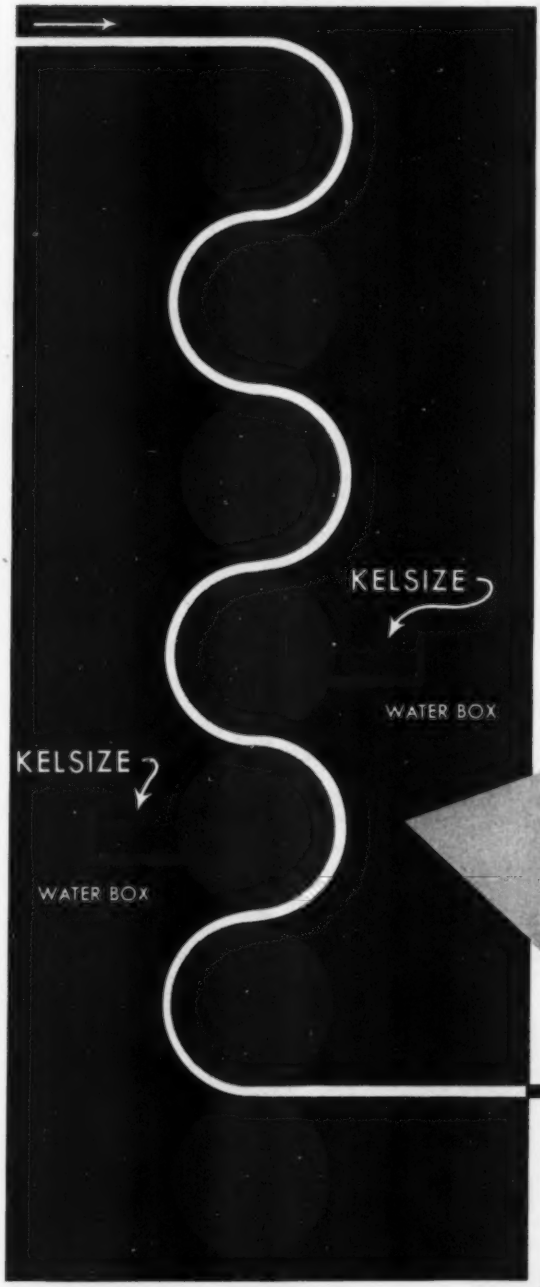
George H. Schell, superintendent of the McIntyre Brothers Paper Co. mill at Fayetteville, N. Y., passed away April 19 at the age of 64.

Joseph E. Holveck, hydraulic engineer for Worthington Pump and Machinery Corp., Harrison, N. J., passed away May 20. Mr. Holveck, a member of several professional societies and credited with several hydraulic patents, had been with Worthington since 1935.

George R. Probst, manager of steam turbine sales in the Wellsville, N. Y., offices of Worthington Pump and Machinery Corp., passed away May 14. Mr. Probst, who held an M.E. degree from Rose Polytechnic, had been associated with the Worthington firm since 1927, joining that company when his earlier connection, Moore Steam Turbine Corp., was acquired by Worthington.

KELSIZE...

the Modern Surface Control Agent



For better results on
FINISH
SURFACE DENSITY
WAX RESISTANCE
for
BUTTER CARTON STOCK
MILK BOTTLE STOCK
CARBONIZING PAPER
GLOSS INK PAPER BOARD

KELSIZE

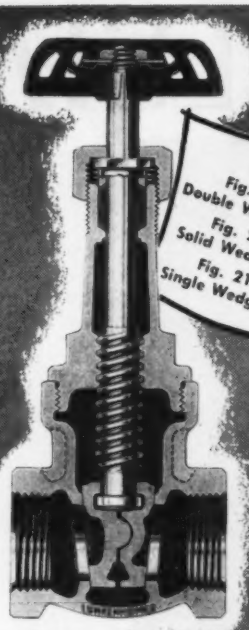
KELCO REFINED ALGIN PRODUCTS

a product of **KELCO COMPANY**

20 N. Wacker Drive, Chicago 6 | 31 Nassau Street, New York 5 | 530 W. Sixth Street, Los Angeles 14

Cable Address: KELCOALGIN—New York

Here's economical standardization on your 125 lb. bronze valve requirements



IN THIS LINE OF VALVES you'll find just what you need to take care of your requirements for 125 lb. service. And you'll also get the inherent values that go into the design and manufacture of every Lunkenheimer product . . . the finest of materials, metallurgically tested and approved; sound engineering design; perfect alignment of parts; meticulous accuracy; craftsmanship guaranteed by skill and ripe experience; the most modern equipment to produce better, and ever better products.

It is the balanced combination of all these factors that has made Lunkenheimer the synonym of highest valve quality, and your guarantee of lowest valve cost per dollar invested.

Give any Lunkenheimer valve a chance to prove itself in service. Once installed, it will quickly demonstrate real economy. Its performance, under all conditions, will be a firm recommendation for your complete standardization on Lunkenheimer . . . and the solution of your valve problems.

Want more information on these fine 125 lb. valves? Ask your distributor for Circulars 566 and 582—or write us direct.

ESTABLISHED 1862

THE LUNKENHEIMER CO.

"QUALITY"

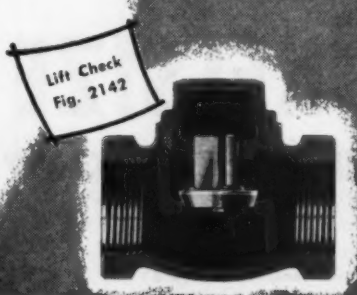
CINCINNATI 14, OHIO, U.S.A.

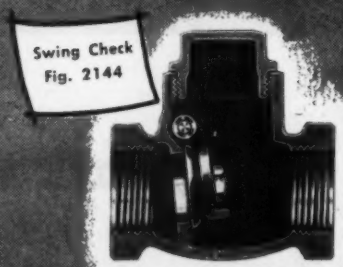
NEW YORK 13 · CHICAGO 6 · BOSTON 10 · PHILADELPHIA 34

EXPORT DEPT. CINCINNATI 14, OHIO, U.S.A.

Your Lunkenheimer Distributor

is stocking these 125 lb. S. P. Bronze Valves. Call upon him for your original equipment, replacement and repair valve requirements.





The Paper Industry International Review

Australian News

Newsprint Buying Co. Formed by Newspapers

Agreements have nearly been completed for the formation of a newsprint buying company composed of metropolitan, provincial and country newspapers in Australia. A working capital of nearly $2,250,000 would be required to be underwritten by shareholders. On formation of the company (probably to be modeled after the British Newsprint Supply Co.) shareholding of Newspaper Supplies will be redistributed and new directors elected.

Formation of the company will safeguard the requirements of shareholders for a minimum period of eight years, the life of the longest contract held by any shareholding organization. It will buy newsprint, make contracts, and sell resulting supplies to its members in accordance with their stated requirements.

Sheet newsprint is excluded from the operations, so that there will be no interference with paper merchants who control the greatest part of that market. If membership is as anticipated, it may control up to 95 per cent of the reel newsprint in the commonwealth.

Advantages of the plan will be uniformity of price, elimination of competitive bidding, greater assurance of continued supply, a simplified method of dealing with overseas sellers and maintenance of close contact with overseas sources. In the event of a price rise or a shortage of supply, the directors would decide whether to pay a higher rate or to recommend an import reduction.

Papers Ask Govt. for Funds to Buy Newsprint from Canada

Australian metropolitan daily, provincial and country newspapers have joined together to send a request to the government asking that more dollars be made available to buy newsprint from Canada, as Australia cannot obtain sufficient newsprint from sterling sources this year.

An important bearing on the stand is that the majority of existing Canadian newsprint contracts with Australian publishers contain a clause specifying that the supplier has the right to supply only double the amount of tonnage taken by the publisher in the previous six months.

This clause means that if the current ban on the import of Canadian newsprint operates fully over a six month period, Canadian mills are under no obligation to supply paper in the next half year.

Fortunately, in the first half of 1950 Canadian contracts are kept in force by the fact that import licences granted before the imposition of the ban permitted import of 5,000 tons of Canadian newsprint. Therefore, a minimum of 10,000 tons will be assured for the latter half of the year if the necessary dollars are found by the government.

Col. Bowater Comments On Newsprint Supply

Newsprint and magazine paper aggregating 70,000 tons annually would be supplied to the Australian press for at least the next eight years by the Bowater Paper Corp., Lieut.-Col. I. F. Bowater reported recently when passing through Fremantle, Western Australia, recently.

"This will represent nearly one-third of the newsprint consumption and all the magazine paper for the ever-increasing weekly press," Col. Bowater said.

Col. Bowater, who was returning to England after two months spent in Australia and New Zealand, had visited the paper mills in Tasmania during his trip, and had been interested in the developments taking place there involving an increased output of 75,000 tons annually. In New Zealand he visited the forest areas and discussed the possibilities of large-scale paper manufacturing there.

Loan Arranged for Associated P&P Mills, Ltd.

Following a practice which is becoming more common in Australia, the directors of Associated Pulp and Paper Mills Ltd. have arranged a debenture loaan of $4,500,000 from Australian life insurance companies to help finance its large development program. The company has large capital commitments not only with Thomas Owen Ltd., Australia, but also with Ballarat Paper Mills Ltd.

Associated Pulp and Paper Mills owns a half interest in Thomas Owen, which is establishing a mill near its Burnie, Tasmania, mill to produce vegetable parchment, greaseproof, and glassines. The final stage of the firm's own paper mill at Burnie, the erection of the No. 4 machine, is under way. It is hoped to have the mill running about the end of next year since some of the machinery for the sawmill has already arrived from Canada.

A GROUP OF FIRMS (Syndicat de la Cellulose Africaine) is to be accorded a concession on a large area in the Belgian Congo to obtain raw materials for a projected pulp mill, according to an announcement by the Banque du Congo Belge. The area to be exploited, located in the Lake Upemba region northeast of Bukama, Province of Katanga, is about 40,000 hectares (1 hectare = about 2½ acres) of marshy land producing reeds and other plants suitable for pulping. Paper pulp is to be produced at first and pulp for rayon, later. The bank states that the concessionaires are to be required to sell at least one-third of the pulp output to Belgium or in the Congo. (From *Foreign Commerce Weekly*)

Strawboard Industry in the Netherlands

Production capacity of the Netherlands strawboard and strawpaper industry is estimated at 375,000 metric tons per year. There are 56 board and paper machines, 18 of which are in the province of Groningen.

Prewar production of strawboard and strawpaper amounted to about 285,000 tons annually, but in 1949 it was only 188,000 tons, or about one-half capacity.

In normal prewar years, approximately 85 per cent of the production was exported to about 20 countries. The United Kingdom is traditionally the largest customer, followed by India, Hong Kong, Belgium, Ireland, Australia, Egypt, Pakistan, and Germany. However, in the first 11 months of 1949, exports to the United Kingdom were only 36,000 tons (60 per cent of the total), compared with 178,000 tons (80 per cent of the total), in 1938. Although the growth of a British strawboard industry, with moderate tariff protection, has hampered the revival of the Netherlands industry, emphasis is being placed on developing other export markets, especially Belgium and Luxembourg, under the Benelux agreement. Also, new products, such as corrugated bituminized strawboard, are being developed.

The depressed condition of the industry was helped in September, 1949, by a reduction in price of about 15 to 20 per cent; common imported strawboard dropped to 110 guilders per metric ton ex factory (1 guilder = approximately $0.26 U.S. currency).

The Association of Netherland Strawboard Manufacturers in December, 1949, renewed for 5 years an agreement designed to bring about co-operation in production, market investigation, quality improvement, and sales practices, including the elimination of competitive underbidding.

Although it is unlikely that the industry will regain its prewar position, the improvement since September, 1949, leads to the expectation that it will remain an important industry in the Netherlands. (From *Foreign Commerce Weekly.*)

Foreign Abstracts . . . . . .

Determination of Volatile Organic Acids in Sulphite Waste Liquor

The liquor (10 cc.) is treated with sufficient 0.1 *N* (or *N*) chloramine to oxidize the sulphur dioxide in solution. The treated liquor, in a distilling flask [connected with a condenser dipping into a receiving flask containing 20 cc. (CO_2-free) distilled water] is heated in a glycerol bath at 130-140 deg. and distilled to dryness and thereafter kept at 130 deg. for 5 minutes. After cooling, 10 cc. distilled water is added to the dry residue and the mixture redistilled to dryness and reheated at 130 deg. The combined distillates are heated with 5 cc. potassium iodide solution and accurately titrated with chloramine to a pale blue color (discharged by 1 drop 0.1 *N* sodium thiosulphate); 2 drops phenol-red are then added and the mixture titrated to a *red* endpoint with 0.1 *N* sodium hydroxide.

The difference between the final titration and that with chloramine is a measure of the organic acid (calculated as acetic acid). The authors also studied the ether extraction method of Doering (*Papierfabr.* 41, 215 (1913)), which, with slight modifications (*i.e.* exhaustive extraction and prevention of emulsions) gave excellent results. Results by the distillation and extraction methods agreed well, unless the original liquor was high in free acid (in the liquors obtained in the production of soft pulps). In such cases the distillation method gave values that were much too high due to the secondary formation of organic acids not originally present in the liquor. This was obviated when the original liquor was titrated with aqueous barium hydroxide to *p*H 2.3 prior to the distillation. Karl Braun and Gerd Krause. *Das Papier* 4, 44-48 (1950). (In German).

Lignin-Hemicellulose Complex in Jute

The authors attempt to furnish data which will contribute to the problem of the structure of the jute fiber. The attack use included swelling and staining reactions, optical studies on jute cross sections in various stages of chemical purification, and quantitative X-ray measurements. Partial delignification was effected through the use of chlorine dioxide solutions followed by extraction with aqueous sodium bisulphite. Holocellulose and alpha-cellulose were prepared by Sarkar's methods (cf. *J. Textile Institute,* 39, No. 2, T44, 1948), and Cross and Bevan jute cellulose was also made by the usual procedure and examined.

The following general conclusions were reached: lignin in jute is not uniformly bound. The relatively small fraction which is most difficult to remove is in the outer layers of the fiber, beyond the secondary layer (as shown by the staining reactions. This lignin serves as a barrier to the swelling of the fiber, and this barrier is probably associated with the middle lamella. Swelling is "normal" when the middle lamella is damaged on mechanical separation of the cells. Staining reactions with Victoria blue seem to indicate the presence of a hemicellulose-lignin complex of acid nature.

Optical studies indicate that the birefringence (observed in cross sections) of the primary wall persists through all the purifications. X-ray studies show that the crystalline cellulose in jute remains the same in quantity throughout the purification. This has the same relation to the total alpha-cellulose as that found in ramie, cotton, and flax. The fiber diagrams of raw jute, partly delignified jute, holocellulose, and Cross and Bevan cellulose exhibit two new equatorial lines corresponding to a spacing of about 14 Angstrom units and 8.5-9.5 Angstrom units. The former is very sharp and its intensity increases with increased purification. However, the lines disappear in an alpha-cellulose prepared from holocellulose or Cross and Bevan cellulose. The X-ray data are discussed at length. 11 tables, 10 figures and 8 references. M. K. Sen and P. H. Hermans. *Receuil Trav. chim.* 68, No. 12, 1079-1105 (1949) (In English).

Properties of Packaging Materials After Cold Storage

This is a contribution from the Institut für Lebensmitteltechnologie, in Munich. Various packaging materials were stored either alone (in moist air) or filled with ice, frozen sweet cider or frozen lemon juice over two and four month periods at 15 degrees *below zero* (C.). The same (filled) packaging materials were also stored for 24 hours at 20 C. The initial materials, and those that had been stored, were then tested for breaking length, elongation, water-vapor permeability, and ease of removal of surface coating materials. The packagings tested were: *Cellophane* A.ST (manufactured at Wiesbaden); *Heliozell* HT (made at Hillegossen); *Transparit* KT (made at Walsrode); *Zewaphan* and *Zewaduplo* B.S. 4027 (both made at Mannheim); *Duplopergamin* (one sample made at Bremen, the other at Oberschmitten).

With the exception of *Zewaphan,* the various treatments had no appreciable effects on breaking length. In the case of *Zewaphan,* the breaking length actually *increased sharply,* because of leaching out of coating material. Inasmuch as flexibilizers in the coatings are leached out during storage, the elongation of the packagings decreased. This is not due to cold storage in air alone, because there was no radical change in the initial elongation when the empty packagings were kept even four months at —15 degrees in air. In the case of *Zewaphan,* even cold storage in moist air caused an increase in air-permeability. (The other packagings showed no very marked changes.) However, when the packages were filled with water or fruit juices and frozen, subsequent tests showed (in most cases) a very marked increase in permeability to air. Duplopergamin however, had its permeability remain practically unaffected excepting when filled with lemon juice and frozen; in fact this fruit juice appeared to affect the air permeability adversely in all instances even on 24 hour cold storage. This effect appears to be correlated with that of *p*H on the lacquers used in the surface coating of the packages.

Cold storage also had some effect on permanence of surface coatings, especially in the case of *Heliozell* and *Transparit.* This was tested by noting the time required for complete removal of the lacquer before and after storage. However, the results are scattered, and the changes in air-permeability could not be correlated with injury to the surface coatings. In cellophane-like products, the surface coatings appeared to be sufficiently well retained during cold storage for all practical purposes. Six tables are given. J. W. Dijk and G. Kaess. *Das Papier,* 4, 83-7 (1950) (In German).

Flotation Tendency of Dissolving Pulps

This is a contribution from the Research Laboratory of Glanzstoff-Courtaulds, G.m.b.h. in Germany. The tendency shown by certain pulps to float, when steeped in 18% alkali during the first stage of the viscose process is discussed. This tendency may lead to later difficulties because portions of the pulp by not being fully submerged in the steeping liquor, after pressing, may have too low an alkali content. Furthermore, the pulps, in certain areas, retain abnormally large amounts of hemicellulose. The flotation is due to air inclusion, and the apparent pulp density is then lower than that of the surrounding alkaline medium. As air is gradually displaced, the alkaline liquor fills the interstices and capillaries, and the sheet sinks. Thus a sheet may show a tendency either to float or sink, depending on its physical properties. If such an (untreated) sheet is then fastened (in parallel) to a suitable hygrometer the tendency will be either to buoy up the hygrometer (provided the pulp sheet floats) or to cause it to sink further into the liquid when the pulp sheet becomes thoroughly saturated with the liquor. The rate of these changes can then be measured quantitatively.

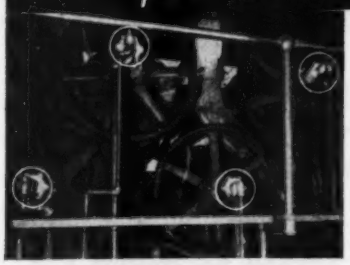
The hygrometer which carries small glass hooks, on which the pulp samples are fastened, is calibrated so that the zero point of the scale indicates the normal position of the hygrometer (without pulp change) in the alkaline liquor. The other scale divisions are so devised that each one represents a (positive or negative) load of 10 grams per square meter of pulp sample. Two sample pulp sheets (5 x 6 cm.) are used concomitantly. The hygrometer is first clamped and hung within a large glass cylinder, and 17.5% caustic soda is run in at 20 C. and at the rate of 6 cc. per minute. This rate of flow is maintained until the pulp sheets are *just* fully covered with the liquor. At this point the hygrometer is released sharply and allowed to float freely; the first reading being taken 1 minute after this release. Readings are taken thereafter at 15 minute intervals during the course of two hours as the hygrometer sinks.

After two hours further change in posi-

COMPLETELY PACKLESS
SELF-LUBRICATING
SELF-ADJUSTING
SELF-ALIGNING

Only Johnson Joints offer *all* these cost-cutting, trouble-saving, production - boosting benefits. *Only* Johnson Joints end *all* the shortcomings of old style stuffing boxes, without compromise of any sort. No wonder so many hundreds of mills, and so many machinery manufacturers, have standardized on Johnson Joints. Why not find out how quickly Johnson Joints can pay their own way in your mill.

Johnson Rotary Pressure Joints



Write for catalog showing sizes and styles for all needs.

Installation in a midwestern mill — some of the 562 Johnson Joints purchased by this company.

JC

The JOHNSON CORPORATION, 845 Wood Street, Three Rivers, Michigan

NINE Publications for the Papermaker

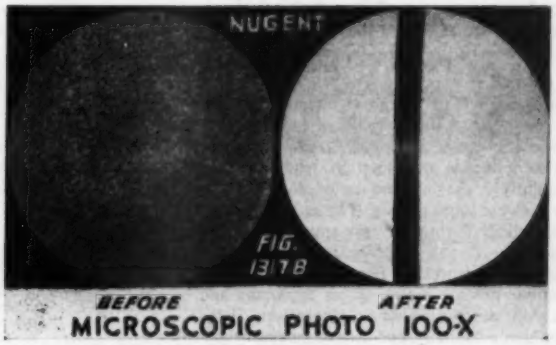
Modern Pulp and Paper Making	$7.25
Drying of Paper on the Machine	1.50
Procedure Handbook of Arc Welding Design and Practice	1.50
Notes and Observations on Beaters	1.00
Lessons in Papermaking—Part 1	.75
Lessons in Papermaking—Part 2	.75
Trouble on the Paper Machine	.75
Pulp Bleaching (A Symposium)	.50
Technology of Papermaking Fibres	.50

Mail your order with payment to:

FRITZ PUBLICATIONS, INC.

59 E. Van Buren Street, Chicago 5, Illinois

Can your lubricating oil filters match this cleaning power?



NUGENT
ABSORBENT OIL FILTERS
GET 99.8% OF THE DIRT

The "before and after" photomicrographs reproduced above are positive proof of the ability of Nugent Filters to keep dirt out of the vital working parts of your equipment. And just to give you an idea of the magnification in this view, the dark line running vertically through the "after" picture is a human hair (.0025" dia.)!

Carefully controlled tests under operating conditions show that Nugent Absorbent Filters will get 99.8% of the dirt! Translated into benefits for you this means longer life and less maintenance for your equipment and substantial savings in oil.

There is a Nugent Filter of the proper size and type to meet your requirements. Write today for complete data.

NUGENT TRADE MARK Est. 1897

Wm. W. Nugent & Co., Inc.
435 N. Hermitage Ave. CHICAGO 22, ILLINOIS

Oil Filters, Oiling and Filtering Systems, Telescopic Oilers, Oiling Devices, Sight Feed Valves, Flow Indicators . . . Representatives in Principal Cities

tion is usually negligible. The determinations are made in triplicate and the averages are tabulated. Graphs are then drawn from tabulated data, showing (in the case of four dissolving pulps) their marked differences in "flotation tendency." Various conditions influence this tendency in a pulp. For example, if the surface of the pulp sheet is roughed up by means of a steel brush, the pulp is much more rapidly submerged. Unexpectedly a pulp when subjected to a 24 hour drying period, shows practically no flotation tendency and the hygrometer sinks almost instantly below the usual level.

When this pulp is reconditioned in air and restored to its initial moisture content it still retains the property of non-flotation. Wetting agents, added to the alkaline liquor also influence the flotation tendency (but slightly), causing the pulps to submerge somewhat more rapidly. The rate of flow of the alkali during the test appears to be of importance, too rapid or too slow a flow period influences the flotation tendency. The author gives a sketch of his apparatus and a full description of its operation. Pulps suddenly "submerged" have a marked tendency towards flotation with the result that even within two hours, the hygrometer may be buoyed above the zero point. 8 Graphs. Werner Koblitz. *Das Papier* 4, 69-73 (1950) (In German).

The Green Color Produced in Wood by Mineral Acids

Early workers reported that wood meal when treated with fuming hydrochloric acid turned emerald green and various theories were formulated to explain this reaction. Hägglund and Björkman *(Biochemische Zeits.* 147, 74 (1924)) felt that this color might be due to a lignin-carbohydrate complex. Bryde and Ranby *(Svensk-Papperstidn.* 50, 34 (1947)) showed that certain actone insoluble (or partially soluble) fractions were obtained, and these also were indicative of such a complex.

The present author's experiments confirm the relationship between the appearance of a green color and the substances responsible for the acetone-insoluble nitrates. The green color, however, is not restricted to hydrochloric acid but is formed by other strong mineral acids as well (e.g. fuming hydrobromic and 50% sulphuric acid). The moisture content of the sample does not influence the results. The color was formed from spruce, pine, aspen, etc., however, in the case of hardwoods like aspen, the reaction was evanescent and the color was olive rather than emerald. Groundwood gives the typical color. Chemical pulps do not give the color, but semichemical pulps show an entire range of colorations varying from that obtained with wood meal to virtual absence of coloration.

The color given by fuming hydrochloric acid is a simple test and offers a rapid method for approximately estimating carbohydrates chemically bound to lignin. Bryde has indicated that the physical properties of a semichemical pulp are greatly influenced by the splitting of the bond between carbohydrates and lignin. Therefore the method may be of some practical significance. F. A. Abadie. *Norsk Skogind* 3, No. 11, 290 (1949) (In French and Norwegian, with English summary).

Utilization of Indian Tree Barks in Building Boards

The barks of *Shorea robusta* (*"sal"*) (I) and of *Eucalyptus* species (II) which represent 6-9% of the weight of the logs were analyzed and utilized in the laboratory production of building boards. The barks were relatively low in extractives. I contained about 32.2% "cellulose," and II contained about 35.2% "cellulose" (as determined by the U.S. Forest Products Laboratory methods). Complete analyses which are given show appreciable amounts of lignin and pentosans.

The composition of the boards, and methods of preparation are given in the accompanying Table 1. In Table 2 are given the properties of the board which indicate that it is possible to make boards of satisfactory strength from both barks. Their water resistance requires improvement and further work is in progress. D. Narayanamurti and N. R. Das. Forest Research Inst. Dehra Dun, India, Indian Forest Leaflet No. 118 5 pp. (1949). (In English).

TABLE 1

Board No. 1	Bark Used 2	Treatment given to bark 3	Fillers and extenders added 4	Resins, etc. added 5	Pressing conditions 6
A	*Sal* bark fiber	Steamed at 15 lb./sq. in. for ½ hour.			At 300° F. for 1 hour and 3000 lb./sq. in.
B	*Eucalyptus* bark fiber	Wet steamed at 30 lb./sq. in. for 1 hour			(ditto)
C	*Sal* bark fiber 350 g.	Steamed at 40 lb./sq. in. for 2 hours		Sulphite waste liquor 700 gms.	300° F. and 3000 lb./sq. in.
D	*Sal* bark fiber 250 grams		Coconut coir pith 110 gms.	Bark soaked in 5% P.F.* and pith in 3% G.N.P.F.†	300° F. and 3000 lb./sq. in. for ½ hour.
E	*Sal* bark fiber 250 grams		(ditto)	Coir pith soaked in 5% G.N.P.F., bark soaked in 5% P.F. 700 gms. Sulphite waste liquor was added	(ditto)
F	*Sal* bark dust 200 grams		Saw dust 1000 grams	Sulphite waste liquor 500 gms., oxalic acid 24 gms., water 700 gms.	Mixed, dried and pressed at 300° F. and 3000 lb./sq. in. (gauge) for ½ hour.
G	*Sal* bark dust 250 grams		Saw dust 1000 grams	Lignin waste liquor 500 gms., P.F., acid catalysed 62.5 gms., Hexamine 4 gms., oxalic acid 26.5 gms., water 250 gms.	Mixed, dried and pressed at 300° F. and 3000 lb./sq. in. for ½ hour.
H	*Sal* bark dust 200 grams		(ditto)	Prolamin extract 500 gms., and P.F. 60 gms.	(ditto)
I	(ditto)		(ditto)	G.N.P.F. 600 gms.	Mixed, dried and pressed at 300° F. and 3000 lb./sq. in.
J	(ditto)			25% P.F. acid catalyzed	(ditto)
K	*Sal* bark 500 grams	Wet steamed at 50 lb./sq. in. for 1 hour		P.F. (NaOH) catalyzed 24 gms., furfural 40 gms., bamboo soda liquor 200 gms.	300°F. and 3000 lb./sq. in. for 1 hour
L	*Sal* bark 400 gms., Bamboo shavings 400 gms.	(ditto)		P. F. Resin (NaOH) catalyzed 24 gms., Furfural 40 gms., bamboo soda liquor 200 gms.	(ditto)

*P.F. indicates Phenol-formaldehyde. †G.N.P.F. indicates Ground nut protein-formaldehyde.

TABLE 2

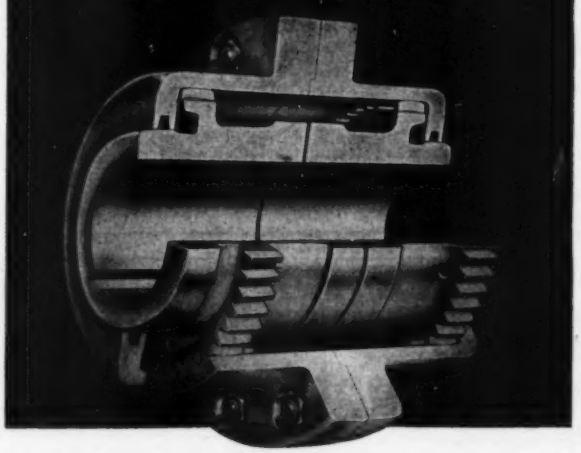
Board No. and bark used	Density gms/cm	Tensile Strength lb./sq. in.	Modulus of Rupture lb./sq. in.	Compression lb./sq. in.	Hardness lb.
A (*Sal* bark fiber)	0.26		168	215	1033
					675
B (*Eucalyptus* bark fiber)			988		
C (*Sal* bark fiber)		466	6236		
D (ditto)		500	8344		
E (ditto)		667	8602		
F (*Sal* bark dust)	0.87	237	1424	779	850
					1285
G (ditto)	0.97	476	1827	1360	1528
					2068
H (ditto)	0.88	313	883	1308	1453
					1010
I (ditto)	0.89	988	3979	2590	2759
					1874
J (ditto)	0.96	643	2970	3313	3539
					2120
K (*Sal* bark)		2316	4435		
L (*Sal* bark and bamboo shavings)		2102	3248		

A member of our Lindsay family who keeps bees brought us what is really an unusual piece of handiwork with the observation, "We have good engineers at Lindsay, too". It is our ambition that the achievements of our Engineering Division may be as uniformly faultless.

THE LINDSAY WIRE WEAVING COMPANY
14001-14299 Aspinwall Avenue • Cleveland 10, Ohio

Lindsay WIRES
FOR PAPER MILLS

POOLE



A COPY OF CATALOG GIVING FULL DESCRIPTION AND ENGINEERING DATA SENT UPON REQUEST.

FLEXIBLE COUPLINGS
POOLE FOUNDRY & MACHINE COMPANY WOODBERRY, BALTIMORE, MD.

PAPERS MADE FINER ...at Less Cost
... with these Glidden SOYA PROTEIN ADHESIVES

ALPHA* PROTEIN

Coating papers with this chemically isolated, soya protein adhesive definitely *adds* to their quality. In addition, it introduces efficiencies which generally lower coating costs! Here are just a few of the properties of Glidden Alpha* Protein which it will pay *you* to know about:

- Alpha* Protein solution is stable over a wide temperature range.
- Alpha* Protein is compatible with the various pigments used and binds them to the fiber of the raw stock easily.
- Alpha* Protein adhesive has a color which does not affect, to any extent, the colors of the pigments used or their hiding power.
- Alpha* Protein alkaline-cut adhesive permits addition of formaldehyde to coating colors to make the finished paper water resistant.
- Alpha* Protein adhesive is free-flowing at a low water ratio.
- Alpha* Protein adhesive keeps pigments or other insolubles more uniformly suspended—prevents formation of hard, difficult-to-disperse masses.
- Alpha* Protein adhesive sets quite rapidly and dries easily without undue shrinkage or interference with the finish when the paper is calendered.

PROSEIN*

A mechanically refined soya protein adhesive, Prosein* is preferred for reasons of economy in cases where certain outstanding qualities exclusive to Alpha* Protein are not required. Compatible with Alpha* Protein and other alkaline-cut protein adhesives in all proportions. An efficient adhesive for many uses.

The Glidden Company
SOYA PRODUCTS DIVISION
5165 West Moffat St. • Chicago 39, Illinois

QUALITY Glidden PRODUCTS

*Trade Mark Registered

Heat Balance for Three Types of Pulp Mills*

The first installment of this two-part article appeared in the May (1950) issue of *The Paper Industry.*

G. EDLING, Chief Engineer
Swedish Steam Users' Association
(Stockholm)

Sulphite mill for strong pulp

In passing on to discuss heat questions at sulphite mills I will first show in Table 2 a statement of the balances in a sulphite mill for paper pulp, without alcohol plant, and I shall afterwards deal with a mill for rayon pulp as well. In both cases, plants for evaporation of sulphite liquor are assumed and in the latter case both alcohol plant and bleaching plant besides.

Cooking in this case is done directly, with circulation, and the digester yield is assumed to be 100 kg. of pulp per cu. m. of digester volume. The chips are assumed to contain 25% moisture. Gassing-heat is utilized for the pre-heating of acid to 65 C. No side relief has been figured with.

As the waste liquor is to be evaporated and burned, this is after the cooking separated from the pulp by properly arranged washing, so that the liquor from the digesters will contain some 800 kg. dry substance per ton of pulp and have a dry substance content of 12,5%. These figures correspond to a dry substance yield of about 75% and a concentration ratio of 0,9.

These values for the dry substance content of the liquor are assumed quite conditionally and I refrain from discussing in this connection the question of the economic limit for extraction of liquor from the digester. This is known to be dependent on a number of factors and there is much to indicate that so far there has not been clearly realized at the mills how far it really pays to carry the liquor extraction.

As regards *liquor evaporation,* there are many alternatives for deciding the system of coupling. Only by thorough examination in each individual case is it possible to decide how an evaporation plant can be best incorporated in the heat system of an existing mill.

At present, as far as I know, there are 15 Swedish plants for waste liquor evaporation in operation or on order. They include different systems and couplings, i.e., back-pressure evaporation and vacuum evaporation, wort and washing evaporation in combination with, and independent of, an alcohol plant.

It does seem justified to regard with optimism the possibilities of mastering the incrustation problem in conjunction with liquor evaporation, at least within the ranges of temperature covered by present experience. This is gratifying, in view of the fact that it is just the incrustation problem which long has been a great obstacle to developments in this special field of technique. Other problems connected with the use of sulphite liquor as fuel are still lacking definite solution. These are chiefly concerned with the liquor's ash content and the amount of SO_2 liberated on combustion. In some cases at least, the ash causes trouble already in the steam boilers by fastening to the tubes, thus blocking the gas channels. This risk appears to be especially great in superheaters and in tube assemblies with small free gas area between the tubes.

When installing new boilers where burning of sulphite waste liquor may come into question, these problems must be considered as far as possible. It is more difficult to change over to burning sulpite waste liquor in older boilers designed for the traditional fuels. It seems that the ash that accompanies the flue gases can be intercepted in mechanical filters, but what is to be done afterwards with these large quantities of ash is still not clear. And it is a matter of considerable quantities. For instance, if we consider a mill with a production of 100 tons of pulp per day, where 800 kg. dry substance is burned per ton of pulp, the total quantity of ash amounts to about 8 tons a day. The ash is extremely voluminous, making it troublesome to transport and to handle generally.

Table 2
Heat Balance in Modern Pulp Mill

Manufacture: Strong sulphite (chlorine number 7)		
Heat production:		Mcal per ton of pulp
Waste liquor combustion		2,350
Sulphur combustion		130
Total		2,480
Heat consumption:	Mcal per ton of pulp	
Cooking	850	
Drying	650	
Liquor evaporation	580	
Miscellaneous	150	
Total		2,230
Heat surplus		250
		2,480

The sulphite liquor evaporation committee has now arranged for more thorough investigations both with respect to the composition of the ash and the content of SO_2 and SO_3 in the gases. Even earlier it had been found that the ash, at least in some cases, is alkaline evidently due to some lime in the ash being present in the form of CaO.

Preliminary investigation of the composition of flue gases seems to show that some 70% of the dry substance's sulphur content is to be found in the form of SO_2 and SO_3 in the flue gases. The SO_3 content causes a rise of the dewpoint by perhaps as much as 50 C., which involves certain risks for the various parts of the boiler plant. The large quantities of SO_2 disseminated in the air with the flue gases may in unfavorable circumstances cause inconvenience in the surroundings. The content of SO_3 in the flue gas, when firing with sulphite waste liquor alone, seems to lie between 0.3-0.5%, which as far as is known is much too low a content for the SO_2 to be extracted for useful purposes. The only possible way, therefore, seems to be to neutralize the SO_3 gas as completely as possible, and the first idea would be to scrub the flue gases with an alkaline liquid, e.g., with lime blended in water. It might be possible simply to use the alkaline ash of sulphite waste liquor for this purpose. This possibility, indeed, is being considered at present by the sulphite liquor committee and there is likewise being examined the possibility of devising a suitable procedure for the reclaiming of sulphur from the dry substance before it goes to burning.

Fuel with high sulphur content has been in use for a long time in industry, e.g., certain kinds of coal and fuel oils. The sulphur content of the flue gases does not seem in those cases in this country, so far as is known, to have caused too much trouble in

(*) Translation of an address given in March, 1948, before the Swedish Association of Pulp and Paper Engineers.

STOP
Screen Clog Slow Downs

H & K PERFORATED METALS

Perfect perforations for paper processing. No tendency for screen to choke, clog and slow-down production. H & K perforations are perforated clean, smooth and accurate, uniform to tolerances as close as ± .0005". Bull, chip, pulp, digester, or bottom screens of stainless steel, corrosive-resistant alloys . all types of metal . . . all gauges. If you like . . . rolled, formed, pre-fabricated to your specifications.

Ask for Catalog 62.

The Harrington & King Perforating Co
5654 Fillmore Street, Chicago 44, Illinois
114 Liberty Street, New York 6, New York

ORISKANY
WATERBURY FELTS
MADE BY
H. WATERBURY & SONS CO.
ORISKANY, N. Y.

COVEL SAW SHARPENERS • HANCHETT KNIFE GRINDERS

HANCHETT MAMMOTH AK

KNIFE AND SHEAR BLADE GRINDER

World's finest heavy-duty traveling wheel grinder for high speed grinding with extreme accuracy and efficiency. Fully equipped to your own specified requirements. Can be furnished in either built-in motor drive or V-belt drive.

Widely used for paper, planer, hog, barker, chipper, and veneer knives. AK grinds flat or concave bevel on any desired angle or square edge. Built in lengths from 84" to 350" and longer when required.

Write for complete data PI-60

HANCHETT MANUFACTURING CO.

World's Largest Manufacturers of Saw Sharpening and Knife Grinding Machinery

MAIN OFFICE—BIG RAPIDS, MICH. WEST COAST—PORTLAND, ORE.

the neighborhood of the plant. Thus one need not be too pessimistic about the risk connected with the SO_2 content of the flue gases from burning sulphite waste liquor, but naturally everything possible should be done to reduce that SO_2 content and so prevent damage.

In the example referred to in the table, the waste liquor evaporation plant has been assumed to be a six-effect vacuum evaporation plant, as no suitable outlet has been regarded as being available for steam from a back-pressure plant. The economical number of effects for multiple evaporation must be investigated for each individual case. It will be dependent on the additional cost and the additional gain from the last effect. The liquor is assumed to be evaporated to 55% dry substance content and the evaporation will then consume 580 Mcal per ton of pulp.

If the mill here considered be supplemented by an alcohol plant the steam requirement there may be satisfied, e.g., by steam extracted from the evaporation plant, provided suitable steam pressures are employed in the evaporation.

The requirements for heat as hot water in the strong pulp mill are insignificant. They can easily be met from available secondary sources of heat, i.e., in the first place from wet air and waste liquor.

According to the table, the total heat consumption for producing strong sulphite amounts to 2.230 Mcal per ton of pulp.

The heat requirement is covered in the first place by burning sulphite waste liquor. It gives 2.350 Mcal per ton of pulp and the mill is self-supporting in regard to fuel. There has also been included in the heat production 130 Mcal per ton of pulp from combustion of 75 kg. sulphur per ton of pulp.

It may be well to point out that in computing the amount of heat obtained from burning of liquor one must count with a lower efficiency in the boiler plant than when, e.g., coal is being burned. This is due to the special conditions for burning sulphite waste liquor that I have already referred to. As a precaution, we usually figure that a steam boiler with burning of liquor has an efficiency that is only some 90% of that with burning of coal.

If the sulphite mill here considered be supplemented with an alcohol plant the heat conditions will naturally be altered to a certain extent. This applies in the first place to the heat consumption, which is governed among other things by the manner in which joint working is arranged between the evaporation plant and the distillation. The heat production also is affected, however, partly because the sugar utilized in the production of alcohol is equivalent to not less than 0.75 kg. coal per litre alcohol. This means that the fuel value of the liquor's dry substance is decreased by 12 to 14% through alcohol manufacture.

Table 3
Heat Balance in Modern Pulp Mill

Manufacture:		
Rayon pulp + alcohol		
Heat production:		Mcal per ton of pulp
Sulphite liquor combustion		3,500
Sulphur combusion		150
Heat consumption:	Mcal per ton of pulp	
Cooking	1,150	
Bleaching	250	
Drying	680	
Alcohol distillation	830	
Liquor evaporation	540	
Miscellaneous	200	
Total		3,650

Rayon pulp mill

Finally I shall give some attention to the heat problems in a rayon pulp mill, with bleaching plant, alcohol plant and liquor evaporation. This type of mill is more difficult to compute in outline than the two dealt with earlier. One has to rely on a larger number of assumptions. Moreover, the individual differences between the various mills in this group are probably more difficult to define, partly because of distinctions on certain assumptions based on experience for this type of mill also, with the results shown in Table 3.

As regards assumptions, what was said above on strong pulp mills applies in appropriate parts here. *Cooking* is done indirectly and the acid temperature in 80 C. With a dry substance yield of 90% and a concentration ratio of 0.8 there should be obtained in the liquor from the digester room 1.400 kg. dry substance per ton of pulp with a concentration of 12.5%.

Drying takes place in flakt dryers as in the previous cases, but here from 44% dry content after the last press. In most mills one would figure with a larger consumption

Chilled Iron CALENDER ROLLS
by Continental
When ordering from your mill equipment supplier . . . specify CONTINENTAL
For precision in custom or standard rolls, rely on the experience of Continental. In many years of meeting the most rigid roll requirements of the ferrous, non-ferrous, textile, paper and milling industries, Continental has earned a reputation for precision and metallurgical accuracy. For a prompt quotation, submit sketches or specifications.
Continental
FOUNDRY & MACHINE CO.
CHICAGO PITTSBURGH
PLANTS AT EAST CHICAGO IND. WHEELING W. VA. PITTSBURGH, PA

of prime heat for bleaching than the 250 Mcal per ton of pulp here used in the calculations. Nevertheless, this figure should be readily attainable with suitable equipment in the bleaching plant and proper disposition of the secondary sources of heat, together with well executed heat recovery in the bleaching plant.

Respecting heat consumption for production of alcohol there is little to be said in this connection. It is figured on the basis of alcohol calculations applied at present.

The liquor evaporation requires some words of explanation. It is here assumed a straight triple back-pressure evaporation plant for wash (from the distillery). The highest temperature that may be permitted in the first stage depends on local conditions. At present there is certain experience with liquor temperatures up towards 150 C. The steam from the last stage is assumed to be utilized in the first place for the alcohol plant, where distillation is indirect. In addition, it covers part of the heat consumption for the digester room and likewise miscellaneous consumption. Many other alternatives for incorporating the evaporation plant in the mill's heat system are naturally available.

The wash is evaporated approximately from 11.5 to 55% dry substance content and is then used as fuel. As steam, there is obtained from it 3,500 Mcal per ton of pulp, which along with useful heat from combustion of 85 kg. sulphur, furnishes the amount of heat required to cover all the heat requirements of the mill. Thus, this mill also is self-supporting without outside fuel.

It is possible that some will find the calculations here, particularly as regards this last type of mill, too optimistic. It may therefore be appropriate to point out that the heat production from firing with liquor as stated in the table by no means is a maximum value. For example, if the thick liquor's dry substance content is raised above the conservatively given figure of 55%, which does not appear impossible, then the heat production would also rise.

Thus, if the dry substance content were increased from 55% to 70%, which also from the standpoint of firing might be an advantage, then the useful amount of heat in the form of steam would be increased from 3,500 to about 3,800 Mcal per ton of pulp.

There is still another margin not utilized here, constituted by the waste wood always obtained from a sulphite mill's wood room. Roughly, it should be possible to figure with obtaining from one cubic foot of wood at least 35 Mcal as steam.

This address unfortunately is burdened with many figures, which possibly interfere with its lucidity. Nevertheless, the figures are necessary if too many details of the computations are not to be withheld from the audience.

I have in this address confined myself to examining the questions before me from the viewpoint of heat technique alone. I have considered this warranted for the reason that it must first be clear how the problems here dealt with may be given a satisfactory solution as far as calories are concerned, before the equally important economic side of the problems is subjected to discussion. Naturally one must arrive at a solution that satisfies the requirements of not only heat technique but also economy. The fuel saving that is sought must not be bought at too dear a price nor must technical developments be carried further than is necessary to cover requirements fully.

I have, however, in the figures presented wished to indicate how far in the present situation *it is possible* to come as regards heat supply, if experience available *now* is fully utilized. That by no means is to say that it would not be possible to show by computations considerably better results if one were inclined to accept more advanced assumptions.

The final result of the presentation may, however, be summed up quite simply: *It has been shown here that the three types of mills dealt with can—from the calory point of view—be made self-supporting as regards fuel.* The steam power has not been considered. It does not come under the heading for this address.

I trust that the figure material presented may serve each person interested as a basis for judging his own operating results in comparison with the peak values obtainable today.

Unfortunately, operating results do not generally yet correspond to the calculations presented. It is to be hoped, however, that developments will show such progress that the self-support respecting the fuel requirements of the mills, shown here to be possible from the heat technique point of view, will soon be attained or surpassed.

Printer's Paper Troubles*

R. H. SIMMONS, Chemist
U.S. Government Printing Office

▶▶▶ In developing a discussion of paper troubles in relation to printing it is necessary to consider the methods by which the paper is to be printed. There are three types of printing: Typographic, planographic and intaglio. Typographic printing is done from relief type and printing surfaces and includes aniline printing. Planographic printing is done from a plate in which the printing and non-printing surfaces are in the same plane. This method includes offset in its various forms. Intaglio printing is done from recessed plates and includes steel die and copper plate engraving and photogravure. Supplementing these is Silk Screen Printing done from stencils.

The quality of the paper depends upon which form of printing is to be used. Arthur D. Little has summed it up in "How will it look; How will it print; How will it function?" This last item "How will it functon" determines how much the quality of the printing will have to be sacrificed in order to obtain the required function.

Atmospheric Conditions

The atmospheric conditions under which the paper is printed have considerable effect on the ease with which the printing operation is carried on. Controlled or uniform temperature and relative humidity eliminate many of the troubles of curl, stretch, wavy edges and static noticed in unconditioned pressrooms. Changes caused by variations in humidity or moisture content of paper affect the manner in which the paper will feed through the press. Curl and wave cause the sheet to feed unevenly and affect the register. Wave may develop into creased and wrinkled sheets. Static usually affects the manner in which the sheet feeds and comes down to the guides on the press.

In order to overcome curl and wavy edges the printer may try to condition his paper by hanging it. Some printers put the paper through the press on the fly. If the pressroom is unconditioned, the pressman has no assurance that the conditions of the pressroom will match the conditioned paper at the time it is run.

Some litho pressrooms expose the wavy paper to infrared lamps on the end of the pile so that the edges are exposed to the heat as the elevator raises the pile on the feeders. This causes the wave to level out. Wavy paper is more subject to wrinkling on an offset press since the printing cylinder and impression cylinder are both flat. The wave has no place to work out. On type presses there are spaces and channels between the type and forms and the paper tends to spread the wave preventing creasing and wrinkling.

Hanging of paper with moisture content which is in considerable variance with the atmospheric conditions may cause immediate changes, the atmospheric conditions of the room affecting paper which has already been conditioned.

High humidity tends to release some of the stresses built into the paper during manufacture. Moisture in paper has a plasticizing action of the paper and the physical qualities increase up to a certain point. Paper with less than 4% moisture shows poor mechanical operation in heat-set printing. The finish of paper is reduced by high humidity.

Pressrooms which operate only one shift and turn off the heat during the night, on cold mornings experience paper difficulties which may last from one to two hours or until the atmospheric conditions settle down to uniformity and the presses warm up.

Formation

The basis of good letterpress printing is a firm impression. After the forms are locked in place, the press is made ready. The packing on the impression cylinder is adjusted until every part of the form prints uniformly. As a result of this preparation of the press it is important that the paper to be printed have a uniform closed formation. The appearance of the sheet when held to

(*) Address given before joint meeting of Kalamazoo Valley Section of the Technical Association of the Pulp and Paper Industry and the Michigan Division of The American Pulp and Paper Mill Superintendents Association, Kalamazoo, Mich., April 6, 1950.

New R-C Bulletin for Paper Mills...

Bulletin 50-B-13 gives you complete, up-to-date details on Roots-Connersville's wide line of vacuum pumps for paper mill service. It includes data on construction, capacities and characteristic curves—it will help you select vacuum pumps for any application.

Send for this new Bulletin 50-B-13 and ask us for an engineering analysis of how R-C Vacuum Pumps can be applied in your mill.

ROOTS-CONNERSVILLE BLOWER CORPORATION
506 Monroe Avenue, Connersville, Indiana

ROOTS-CONNERSVILLE
BLOWER BUILDERS SINCE 1854
ONE OF THE DRESSER INDUSTRIES

the light should not be cloudy, show thick or thin spots, streaks or pin holes.

A cloudy formation indicates non-uniformity in thickness. The dark areas are clumps of fibers matted together. In passing through the printing press, these lumps or thick spots act as bearers for the forms and prevent uniform impressions. The low spots in the paper do not get sufficient pressure to give a uniform transfer of ink. This produces a mottled effect in the overall print.

When a sheet of paper is being calendered the formation has an important effect on the finish and thickness obtained. A wild formation must be given a harder calendering to bring it to uniform thickness. This action may result in the high spots becoming smoothed down to hard non-ink-receptive spots. Burning and blackening of the sheet may also occur and the opacity is reduced.

When a pressman prints a paper with a wild formation he must increase the pressure to force the type into the lowest spots on the paper. If these spots are hard and not ink receptive he will also increase his pressure to force the ink into the hard spots.

An impression which is heavier than a kiss impression is detrimental to the life of type and halftones causing them to wear more rapidly.

Due to the rubber blanket used in offset printing being resilient the paper formation is not as important as it is in typographic printing. The introduction of the soft rubber plates in typographic printing eliminates some of the defects found in printing rough or uneven surfaces.

In gravure printing a smooth uniform finish and a closed formation is required.

Thickness

A uniform thickness from sheet to sheet is important. In the practice of multiple roll cutting it is important when cutting printing papers, to combine rolls of the same thickness and finish. The presence of one thick or thin roll in a set, or one roll which does not match the rest in finish causes difficulty for the pressman.

In a mill run, if there are variations in the thickness, the finish or some other factor which is not up to quality, these rolls should be separated from the satisfactory paper. It is better to segregate and cut them together so that each skid or case of paper will be uniform in itself. It often happens that compensations can be made in printing to take care of variations in finish, thickness or ink receptivity if the lot is uniform but when these variations are mixed in one skid it is hard to adjust the conditions to take care of the extremes.

With thin papers as a class, we find that it is necessary to spend more time on makeready. The thin paper has less cushioning action and a kiss impression is more important for good results. A closed formation is also more important on thin papers.

Variations in thickness of coated papers may be the cause of picking due to excess pressure or lack of pressure. Too much pressure can also produce a squashed impression, too little pressure a mottle.

Smoothness

In order to print halftones satisfactorily it is necessary to use a paper with a smooth uniform finish. Such a finish permits closer contact between the paper and the printing plate. The smoother the finish of the paper the greater the detail and the finer the halftone screen which can be printed on it. On newsprint it is customary to print 80 line screen halftones. If a plate with a finer screen is used some of the halftone dots will not contact the paper, others will only partially touch and a broken print will be the result. Due to the uneven contact the ink moves into the spaces between the dots on the plate causing fill in. A mottled print results.

As the paper industry developed smoother papers the fineness of the halftone screen was increased. Under special conditions 400 line screens are being printed.

Printing smoothness is different than the visual smoothness of paper. It depends upon the molding quality or compressibility of the sheet. When an impression is made the rougher sheet may compress so that it gives a more uniform contact between the paper surface and the printing plate than a smoother harder sheet. Printing smoothness is, therefore, a relation of the softness of the paper.

Ink Receptivity

. This characteristic is the manner in which the surface of a paper accepts printing ink at the instant of contact between the paper and the ink. A paper which receives the ink readily and uniformly over the whole surface is said to have good ink receptivity.

In paper which does not have good ink receptivity the ink tends to skid or slip out from under an impression and build up on the sides of the type and halftone dots. This produces fill-in and mottled printing.

We do not know too much about the mechanics of ink receptivity due to the fact that there seems to be no manner of determining just what happens between the paper surface and the ink at the instant of contact between the two. Due to the pressure of printing there is a hydrostatic pressure set up which in many cases forces the paper to take the ink. Too much pressure may cause the ink to penetrate too far into the sheet causing strike-through. Some papers which do not have good ink receptivity fail to accept the ink even under pressure.

Ink Coverage

There are several factors which affect ink coverage. The first is smoothness. A smooth paper will give more mileage to a pound of ink than a rougher sheet. In the case of the rougher sheet it is necessary to carry more ink on the forms to fill the valleys in the paper surface. A dull coated paper takes more ink for the same forms than a glossy coated paper.

Ink receptivity affects the ink coverage. A receptive sheet will take more ink to obtain the same tonal value of the print than a less receptive sheet.

In printing light colors such as yellow or light blue, it is not hard to use much more color than is required to cover the form properly, due to the lack of tonal value. It is often possible with these colors to back off the ink supply and still get equal coverage.

In printing a dull coated paper with a high percentage of ink coverage it might be more economical to print a glossy coated paper with a dull ink and obtain the same result with less expenditure of ink.

Ink Drying

Under normal conditions the conventional linseed oil inks dry satisfactorily if sufficient drier has been added. There is a factor in some inks where, by chemical or physical action, they absorb drier during storage so that they will not dry. In lithography, we find that a paper with a low *p*H retards drying, while a *p*H on the alkaline side aids drying. However, the use of carbonate fillers in litho papers does not give good results.

Heat helps the drying of linseed oil inks. Patra has shown that heat has more effect with lower concentrations of driers.

In lithography the moisture content of the

ENGLISH ECCO CLAYS TRADE MARK CLAYS

UNIFORM • SUPERIOR • DEPENDABLE

English China Clays Sales Corporation
551 Fifth Avenue, New York City

Only LIGHTNIN® MIXERS

(MIXCO® ENGINEERED)

Give You All These "EXTRAS"

PORTABLE MIXERS—Nearly 30 models, from 1/8 to 3 H.P. Wide selection of motors and materials. *Write for Catalog B-75.*

AGITATION THAT FITS THE JOB. Every LIGHTNIN Portable Mixer is accurately sized to do the work you expect of it. Larger LIGHTNIN units are custom engineered to the application.

EQUIPMENT BUILT TO LAST. Every part of every LIGHTNIN Mixer is designed and built *specifically for mixing service.*

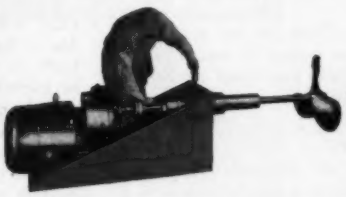
SATISFACTION GUARANTEED. Every LIGHTNIN Mixer is guaranteed to do the job for which it is recommended—or you get your money back!

A PACKAGE READY TO USE. When you buy a LIGHTNIN, there is nothing extra to buy or build. You clamp or mount the mixer on the tank . . . connect to power supply—and start mixing!

MIXING SKILL UNSURPASSED. Mixco engineers help you with exclusive data that enables you to *predict process results accurately.* MIXCO's 25-year backlog of mixing technology is absolutely without equal in the industry!

Send for complete literature on types shown

TOP ENTERING AGITATORS—Nearly 100 standard models, from ¼ to 100 H.P. For open or closed tanks. *Write for Catalogs B-78 and B-89.*



SIDE ENTERING MIXERS—For tanks up to 5 million gallons capacity. Sizes from 1 to 25 H.P. *Write for Catalog B-76.*

USE THEM FOR . . .

Stock chest agitation • Feed water conditioning • Continuous or batch treating • Waste neutralization • Clay slurry and coating materials

MIXING EQUIPMENT CO., Inc.

(MIXCO)

1035 GARSON AVENUE, ROCHESTER 9, NEW YORK

In Canada: William & J. G. Greey, Ltd., Toronto

paper and the ink are very important. A high moisture content may retard drying indefinitely. Water or fountain solution emulsified in the ink has the same effect besides weakening the color of the ink. Absorption into the paper of water from the blanket retards drying of the second color. Excessive alum may cause the litho plate to scum. The presence of water soluble salts in paper tend to work back into the fountain and assist in emulsifying of the ink and fountain solution.

Offset and Strike-through

In close relationship to Ink Receptivity are offset and strike-through. Offsetting takes place when an ink does not set or dry rapidly enough, when too much ink is used in printing and when pressure is applied to a freshly printed pile of paper. Offsetting may take place due to the presence of static in the paper. Some inks are electrically attracted and transfer from one sheet to another by the pull of static.

When a form contains a brass rule or type which is over type high it will emboss the sheet giving points which will rub against the sheet previously printed causing the ink to offset and smudge.

Heat-set and moisture-set inks dry before they reach the folders and prevent offset.

Strike-through is the other extreme. It is due to ink penetrating through the sheet. Too thin an ink is usually the cause of strike-through. Sometimes the vehicle separates from the pigment and transparentizes the paper so that it lacks opacity and the ink appears to be striking through the paper. The porosity of the sheet may be so high that the ink is pulled through the paper by capilarity. Ghosting can be attributed to strike-through. Offsetting which registers exactly over the impression on the back of the sheet is sometimes mistaken for strike-through.

A measurement of the rate of oil absorption of the sheet is a good test for determining possible offset and strike-through. The ink may then be changed to fit the paper.

To assist in preventing offset a pressman may slip-sheet, use a bottomless box at delivery or use an anti-offset spray.

On some highly filled sheets and on pigment coated papers, we discover a condition which is called chalking because the vehicle of the ink filters away from the pigment leaving it in a fairly dry state which rubs easily. In other words, the vehicle does not remain with the pigment in a sufficient quantity to bind it to the paper. A condition of this kind is often called slow drying. It can be controlled by increasing the drying rate of the ink. This will reduce the time in which the vehicle remains in a liquid state and thus prevent it draining away from the pigment. A coated or highly filled sheet gives a greater surface area for the oil to contact and hence more oil is drawn away from the pigment. Usually a job which has chalked will finally dry but it is very disconcerting for a pressman when he comes to back up a job which has been promised for delivery to find that the ink is not dry. He may find that winding of the sheets will help. Heat helps drying, but in a case of chalking, heat will only increase the trouble due to increasing the fluidity of the ink causing more chalking.

It is not uncommon for a pressman before printing with an ink on a given paper to make pat cuts or draw-downs to see how the ink takes on that paper, also to determine the drying time. This is a good practice because it will show oil penetration, drying time and possible chalking. If possible, it is better to pull proofs on a press since a pat out does not give the relationship of the ink under pressure, and in a pat out it is common to pat the ink over the same spot several times which would simulate a double impression. Also more ink will be placed on the paper so that chalking may not be observed. The use of the press will also indicate the ink receptivity of the sheet much better than the pat out.

Pick

Pick is a term which is loosely used by pressmen. Anything from loose dust to splitting of the paper is called picking. Loose dust or particles in the paper give results similar to picking but they do not necessarily come from a lifting of the surface of the paper. Now and then, the surface of the sheet has small unbound particles of fibers or coating. These easily lift out when brought in contact with printing ink. The next phase is the breaking away of the surface from the body of the paper and finally the splitting of the body stock itself. In some cases, the surface of the paper blisters due to too tacky an ink.

The presence of paper dust and free fibers cannot be remedied by reducing the tack of the ink. It is possible to clear up picking in the case of coating breaking away from the body stock or weak body stock by re-

ducing the tack of the ink, but in some cases the strength of the paper is so low that to reduce the ink further would produce mottle or weaken the color to such an extent as to give poor printing.

The improper handling of coated paper may crack the surface causing it to pick. In trying to combat curl a pressman often breaks the curl by bending the corners of the pile against the curl. Too sharp a break with coated paper may crack the coating. The use of rough or broken wedges in the pile to combat curl has been known to scratch or break the surface of coated papers. Loose tapes on the press may snap against a sheet to break the surface. Any breaking of the surface of a coated sheet will produce picking.

Loose fibers or coating are particularly objectionable in offset printing due to the use of the rubber blanket. Any loose fibers tend to transfer and build up on the blanket. The fibers may transfer from the blanket to the plate and print, causing black spots with white halos. Pick which adheres to the blanket may buff the printing plate so that it loses its ink resistance and begins to take ink.

Loose fibers from the dampening rollers have been known to attach themselves to the printing plate. These appear similar to loose fibers from the paper.

In typographic printing pick does not always cause trouble because the form rollers may have enough tack to lift the pick from the plates and carry it back into the inking system.

Picking on multicolor printing may not occur until the second or third impression due to a breaking or weakening of the paper in preliminary passes through the press.

With coated papers too much pressure may cause the surface to break. Too little pressure may also be a reason. There are cases where the ink in two and four color printing sets so rapidly on coated paper that the overall tack of the system breaks the coating.

Gloss ink performs in much the same manner and sets so rapidly that when the amount of ink is insufficient the paper picks. When the ink flow is increased the break occurs in the ink film rather than in the paper.

Opacity

Opacity is of prime importance in printing papers. A low opacity in book papers makes it difficult to read the text due to the show-through of printed matter on the under side of the page as well as from the next page.

Oil penetration from the ink may transparentize the sheet enough to permit show-through even though the actual opacity of the sheet is satisfactory.

Color of Paper

In describing the whiteness of papers, industry has come to accept brightness as a term measuring whiteness. In the white and near-white papers brightness is a measurement of the reflectance of those papers in the blue and violet portions of the spectrum.

In order to compensate for slight variations in the actual shade of the paper as it is being made dyes are added to the beater. The result is that there are several near-white colors which can be classed as blue-white, cream-white, and pink-white. In some cases the color may be a green or muddy-white.

Which tint of white is selected for printing papers has considerable to do with the contrast obtained in printing. The blue-white is favored by many for printing machinery catalogues, silver designs and for color work to increase the contrast. The same is true of the cream or natural white. The use of a blue-white paper for printing a landscape gave a greenish tinge to the halftone but when a pink-white paper was introduced the same halftone appeared to have an effect of sunshine or warmth in the print. The degree of contrast obtained with the various tints of white depends upon the color of the ink used in printing the paper.

Variations in the color of two-sided papers is especially noticeable in books and folded articles where both sides of the sheet can be viewed at one time. Two-sidedness in colored papers is just as objectionable. Two-sidedness in paper can affect the appearance and color of the ink. Variations in color are especially noticeable in the cut edges of a book or pile of paper.

Papers used for heat-set printing are susceptible to the browning action of the heaters.

Paper for Gravure Printing

Gravure printing requires a fairly soft absorbent paper. The paper must be soft enough to press down into the gravure cells and receptive enough to draw all the ink out. The paper must not have any harsh or abrasive material in it since only one small scratch will ruin the expensive gravure cylinders.

Gravure is finding a wide field in the printing of cartons, labels and wraps. In recent issues of printing magazines, there are articles favoring lithography, analine and gravure printing for the printing of cartons.

There seems to be very little trouble with gravure printing as far as the printing medium is concerned. The inks dry by evaporation and can be printed on almost any medium provided it does not have too high an absorptive surface.

Some very fine printing with great depth of tone is being done by gravure. The introduction to this medium of the sheet-fed press has expanded the field to which gravure can look for trade. Its present field is in the news and magazine publication.

Mechanical Troubles

Factors which cause poor registration are fuzzy edges, edges not square or straight due to the paper pulling under the cutter-knife. In the case of fuzzy edges they may be burred so that more than one sheet is picked up by the feeders. Two or more sheets may be picked up by the suckers when feeding very porous papers and in the case of sticky size spots or pitch spots holding two sheets together.

With thin papers the body of the paper is not stiff enough to prevent its folding or wrinkling during the trip down to the guides. Porosity may cause more than one sheet to feed at a time. In the joggers the paper may rumple instead of adjusting to the push of the joggers.

On heat-set web presses such things as calender cuts, haircuts, slime holes, cracked or torn edges are causes of much down time. Rolls out of round, slack on one end and tight on the other, or uneven winding within the roll do not help with good registration. Poor splices and improperly flagged splices are the cause of web breaks and plate batters.

A close inspection of the paper on delivery may reveal evidence of poor handling during transit. Rusty straps or warped wrapping may show that the paper was exposed to high moisture which may have affected the paper. Loose straps on a skid may be evidence of paper shifting in the pile causing wrinkle or wave. Wrinkled paper may be caused due to the paper snagging as a result of the case having been stood on end. Unsatisfactory papers due to these causes should be kept out of the press-room.

Printing Speeds

With increased speeds in printing all the factors causing troubles in printing are accentuated. Ink receptivity is extremely important. Trapping of inks in four color printing becomes important due to the internal stresses of the ink which must be overcome. Pick is also accentuated due to these stresses. High speed printing is done at present by rotogravure, aniline and heat-set printing.

▶ INDUSTRIAL GLOVE—"Sand surface" grip makes this glove thicker, stronger and longer wearing. Palms and fingers are approximately 1/5 in. thick. Smallest objects are held firmly. The B. F. Goodrich Co., Akron, Ohio.

Use Anthrafilt*

To Solve Your Filter Problems

1. Increase your filter plant output without increasing the size of your present plant.

2. ANTHRAFILT, the hard coal filter medium will increase rates and lengths of filter runs.

3. Weighing only about one half as much per cubic foot as other types of filter media ANTHRAFILT backwashes at lower rates.

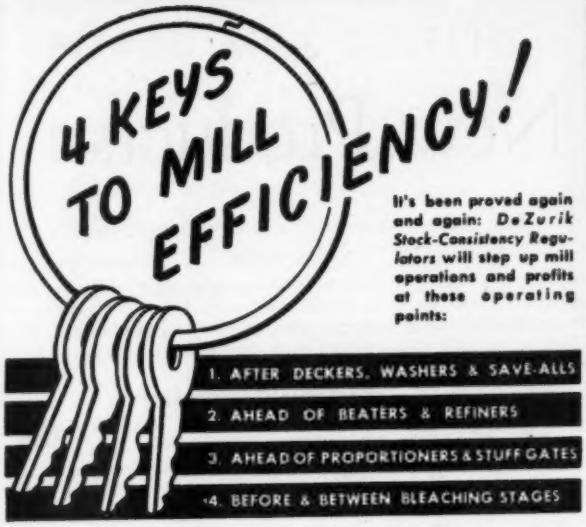
4. Being essentially a carbon you can filter sanitary supplies, hot or cold process water or acid and alkaline solutions.

Many paper mills in all sections of the country now use ANTHRAFILT exclusively. Why not write us today for full details, test samples, recommendations and quotations?

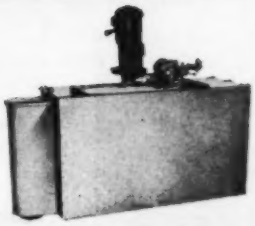
PALMER FILTER EQUIPMENT COMPANY
822 East 8th St., P. O. Box 1655
Erie, Pennsylvania

Representing

ANTHRACITE EQUIPMENT CORPORATION
Anthracite Institute Bldg.
Wilkes-Barre, Pennsylvania
*Trade Mark Reg. U. S. Patent Off.

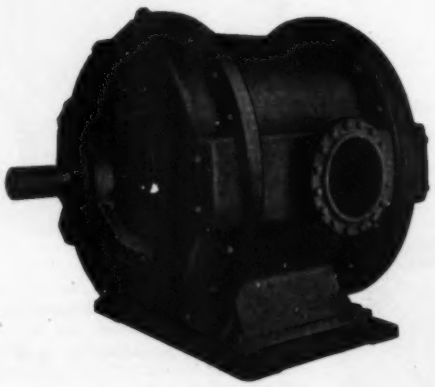

4 KEYS TO MILL EFFICIENCY!
It's been proved again and again: DeZurik Stock-Consistency Regulators will step up mill operations and profits at these operating points:
1. AFTER DECKERS, WASHERS & SAVE-ALLS
2. AHEAD OF BEATERS & REFINERS
3. AHEAD OF PROPORTIONERS & STUFF GATES
4. BEFORE & BETWEEN BLEACHING STAGES

DeZURIK REGULATORS control consistency within .001. There's no complex adjusting, no clean-up problem, no irregularity. *Detailed Brochure on request.*



DeZURIK SHOWER CO. SARTELL, MINN

ONLY NASH VACUUM PUMPS HAVE ALL THESE FEATURES



One Moving Element. Non-pulsating Vacuum. No Internal Wearing Parts. No Internal Lubrication. Handles Liquid With Air. No Expert Attendance. Constant Efficiency. Low Maintenance Cost.

NASH ENGINEERING COMPANY
SOUTH NORWALK, CONNECTICUT, U. S. A.

DICALITE
Paper-Aids

. . . improve liner coverage and permit reduction of bleached sulphite pulp, yet maintain quality at lower cost.

"We used the regular furnish and then without making any other changes we put in 4% Dicalite BP-1 in the under liner and the liner and 3% Dicalite BP-3 in the filler and back.

"The results became apparent immediately, showing a much better formation, better brightness, so that Mr.—— commenced to reduce the amount of bleached sulphite in the liners, and we cut back on the bleached sulphite several times so that the final furnish in the beater was 10% lower in bleached sulphite and this was the lowest amount of this material that they had ever used and still obtain a better sheet, with better coverage and brightness than with their standard furnish."

The above quotation from a Dicalite Engineer's report is typical of some of the benefits Dicalite gives. We will gladly send full information on request.

DICALITE DIVISION, GREAT LAKES CARBON CORPORATION
NEW YORK 17, N. Y. • CHICAGO 12, ILL. • LOS ANGELES 14, CALIF.

DICALITE
PAPER AIDS FOR BETTER PAPER PRODUCTS

The Paper Industry New Products

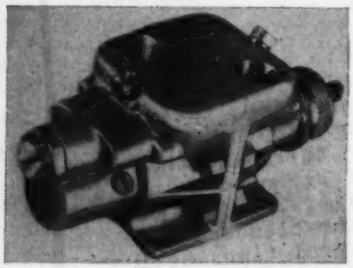
Paper Roll Truck

Simplifies lifting, transporting and positioning of paper rolls.

A 30-inch wide carrying platform on hydraulic elevating paper roll truck has a 20-inch concave surface designed to fit 36 in. diameter rolls. Platform drops to the floor in its low position, and the lip forms a short ramp so that the paper can be rolled on the carriage. By means of a single speed hand pump operating a hydraulic hoist, the platform can be lifted 28 inches, so that the roll can be properly placed in a printing press or cutting machine. Lyon-Raymond Corp., 8060 Madison St., Greene, N. Y.

Gearless Pumps

Incorporate built-in hydraulically balanced by-pass.



With this balanced by-pass, the Eco pump, when acting as a booster pump for city water, delivers a constant volume of water at constant pressure, regardless of any variation in the pressure of the city water lines. The entire operation involves only four small parts. Eco Engineering Co., 12 New York Ave., Newark, N. J.

Wood Preservative

Deadly to fungi, non-toxic to human beings.

Based on synthetic resins, "Non-Tox" contains a newly developed, non-toxic, solubilized copper fungicide. It is claimed that in recent tests the product has exhibited unusual fungicidal effectiveness, and in comparative tests with a specification wood sealer, has displayed superior resistance to fungi, especially when heated at 185 F. for 48 hours. The new product is recommended for sealing and preserving wood products such as millwork, truck bodies, prefabricated house panels, poles, piling and flooring. Brooklyn Varnish Mfg. Co., Industrial Research Div., 50 Jay St., Brooklyn 1, N. Y.

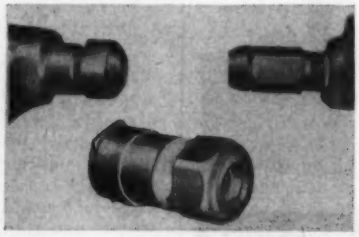
Brake Motor and Brake

Bonded metal linings used in brake.

Simplicity of design, and dependability for applications requiring frequent instantaneous stopping and starting are offered in this brake motor. Outstanding features are the prelubricated for life cartridge bearings and brake lining that eliminates the need of adjustments, making the unit ideal for use in inaccessible locations. Brake linings are not affected by heat, cold, dampness, salt water, fungi, grease or oil. Crocker-Wheeler Electric Mfg. Co., Ampere, N. J.

Revolving Joints

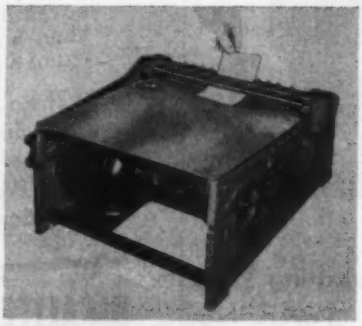
No bearings—no lubrication—no flexible hose.



These revolving joints are for cooling and heating all types of rolls used in paper mills and all industries where it is necessary to heat or cool rotating rolls. Rotation takes place between a ball and a seal that will take temperatures from minus 40 deg. to plus 500 deg. Joints can be used within syphon pipes. A spring-seated seal inside the cartridge holds the pressure, the higher the pressure the tighter the seal. Rotherm Engineering Co., 4911 W. Irving Park Rd., Chicago 41, Ill.

Coating and Gluing Machines

Features a slow speed tank roller.



The 2R series is adapted to over-all precision coating of glue, lacquer, varnish, resins, latex and other liquid solutions. The tank roller feature can be driven at any one of four speeds, whichever one best suits the solution being used. Coating tank and tank roller can be quickly removed for cleaning, and a non-clogging coating regulator assures the correct amount of coating for all types of work. A ductor-roller type of coating control irons out lumps in the solution, and a thermostatic control keeps solutions at proper temperatures. Potdevin Machine Co., 1285 38th St., Brooklyn 18, N. Y.

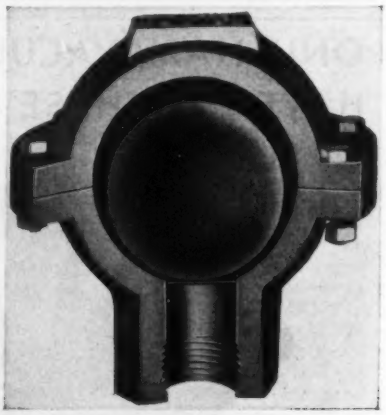
Portable Compressors

Designed for operating small air tools on miscellaneous service jobs.

Trailer-mounted portable compressors are furnished complete with air-cooled compressor, V-belt drive to gasoline engine, and are mounted on sturdy pipe tank type bases. Unit is equipped with semi-pneumatic, rubber-tired, roller-bearing wheels, drawbar, trailer hitch and stabilizer leg. Claimed to be ideal for painting contractors, stone masons, public utilities and industrial plants for operating pneumatic equipment. Gardner-Denver Co., 100 Williamson St., Quincy, Ill.

Shock Absorber

For eliminating shock and hammering of liquid piping systems.



It is claimed that hammering, leaky joints, opened pipe seams and excess pressure on valve packings can be reduced to a minimum when damage is caused by quick closing of valves or any action that stops flow of liquid through a pump, by use of these pipe line shock absorbers. There are no moving metal parts, and absorber can be installed in any position. R-S Products Corp., Wayne Junction, 4530 Germantown Ave., Philadelphia 44, Pa.

Resin Cement

Has novel physical and chemical properties.

Legite is a thermo-setting synthetic resin cement that is inert to solvents, fats, oils, greases, alkalis and acids, except strong chromic, nitric, and sulphuric over 60 deg. Bé at temperatures to 375 F. It is partic-

BOARD MILL SCREENS

Probably more Board Mill Screens are equipped with **Fitchburg NEW TYPE-DUPLEX SLOT Screen Plates** than any other type of plate.

High capacity . . . permanent true slot alignment . . . Freedom from "strings" and plugged-up slots.

Get a full day's work from your screens with these remarkable plates. Furnished in tough, "Fitchburg Bronze," plain or chromium plated.

FITCHBURG
Screen Plate Co., Inc.
301 South Street
Fitchburg
Massachusetts

HUBINGER
OK
BRAND

Dependable Quality for 69 years . . .

STARCH *for*
TUB SIZING
BEATER SIZING

THE HUBINGER CO.
Keokuk, Ia. *Est. 1881*

The Trade-Mark of
Dependable Felts

The Waterbury Felt Company
SKANEATELES FALLS, N. Y.

FIRST OF A SERIES

"K" ON A FITTING MEANS PRECISION

You are on solid ground when you demand precision in the pipe fittings you buy. You get that precision in "K" fittings. Examine a few, and do it critically. The fine workmanship will impress you.

All the way from pattern and core making, clear on through to final inspection, precision is the watch word. Nothing is left to chance.

"K" Fittings are, therefore, sound and true. They make up easily and quickly to form tight joints.

"K's" test high—actually exceed code requirements. They are also Underwriters' Laboratory approved.

Insist upon fittings bearing the "K" trademark—first fittings to carry a trade-mark.

THE KUHNS BROTHERS CO.
1818 McCALL ST., DAYTON 1, OHIO
Established 1887

K CAST-IRON FITTINGS
3,000 SHAPES AND SIZES

ularly useful for jointing acid-proof brick and pipe in the construction of neutralizers, disposal units, tanks, process equipment, towers, fume ducts and stacks, floors, etc. The product may be stored at atmospheric temperatures, is nontoxic, and sets quickly to form a dense, shiny, shock resistant joint. Claimed to be noninflammable, and has a compression strength in excess of 10,000 lb. psi. Electro Chemical Supply & Engineering Co., 750 Broad St., Emmaus, Pa.

Materials Handling System

Provides greater handling efficiency than floor trucks.

The Nifty Lifter is a simple jack with a positive latch, equipped with sturdy wheels and handle. The semi-live skid is steel bound and has hardwood topboards for many years service. Wheels are equipped with anti-friction bearings for the easy movement of heavy loads, and may be steel or rubber-tired. To move a skid load, the operator wheels the lifter under the lifting horn of the semi-live skid. A downward stroke of the handle engages the positive latch and lifts the two skid legs clear of the floor. The load is then ready to roll easily on the anti-friction bearings. A 2500-lb. load requires only 701-lb. effort. Barrett-Cravens Co., 4609 S. Western Blvd., Chicago 9, Ill.

Surface Pyrometer

Has a wide selection of thermocouples.

Suitable to almost every industrial surface and sub-surface temperature measurement problem, this portable, compact and quick acting instrument features a large 4-inch direct-reading indicator mounted in a rubber cushioned housing. Instruments are available in four temperature ranges from 0-400 F. to 0-1200 F. The Pyrometer Instrument Co., Inc., Bergenfield, N. J.

Water Testing

Water hardness measured in approximately one minute.

Hagan Calcium Test is a direct titration to a clear-cut color change. Similarly, the Hagan Total Hardness Test involves a simple direct titration with a distinct color change at the end point. In testing for total hardness, a clear sample of water to be tested is measured into a porcelain dish. A small amount of buffer solution is stirred in to bring the sample to a suitable *p*H value. Indicating solution is then added, and stirred. The sample at this point shows a red color.

The final step is addition of the titrating solution, which turns the color to blue. Disappearance of the last trace of reddish tinge marks the end point. Procedure for hardness due to calcium alone is identical, but with a different buffer solution and indicator, resulting in a final color of violet blue after titration. Equipment and reagents required for either test are available through Hagan Corp., 3300 Hagan Bldg., Pittsburgh, Pa.

Smoke Density Indicator

Provides an overall check of combustion efficiency.

Photoswitch Excess smoke indicator Type 2A10C gives a continuous indication to the boiler room of the condition of the gases which are passing through the flue, signaling when either smoke or air are sufficiently excessive to cause inefficient combustion or create a smoke nuisance. The unit consists of photo-electric control, light source, and densometer. These operate a dual relap system and indicating meter in the densometer. Equipment is of rugged construction supplied in dustproof housings. Recording equipment to record smoke density is available for use with Type 2A10C. Photoswitch, Inc., 77 Broadway, Cambridge 42, Mass.

Stop Valves

Interchangeability of parts reduces maintenance inventories.

Forged steel stop valves can be installed in almost any service where small OS&Y steel globe or angle valves are used. Swing bolted packing glands and large packing chambers make repacking simple. Bronze yoke bushings prevent galling or freezing of stem. Rated for 600 lb. at 900 F. and 1500 lb. at 850 F. for steam, oil, and gas service. Edward Valves, Inc., 1200 W. 145th St., East Chicago, Ind.

Protective Coating

Provides rust-inhibiting action and resistance to corrosive conditions.

For effective protection of exterior surfaces exposed to atmospheric and other corrosive conditions, the use of "Kem-Ban," a multi-purpose protective paint, is claimed to be ideally suited for application on metallic and nonmetallic equipment, products, or parts. The paint is applied by spray, dip or brush methods and dries in from 20 to 30 min. The resultant coating is claimed to be a fire-retardant film of uniform thickness and high hardness, that will not check, peel or crack. The material is also said to be suitable for use as a sealer for hot plaster, stucco, cement, concrete and other alkaline materials. Ace Laboratories, 1614-18 Coutant Ave., Lakewood, Ohio.

Gearmotors

Make use of hard helical gears and other moving parts.

Load carrying capacity, wear life, quietness of operation and compactness of design are improvements incorporated in these new gearmotors. Manufactured in 17 sizes, the gearmotors provide single, double and triple reduction units having output speeds from 780 rpm down to 7.5 rpm. Ratings from 1 through 75 h.p. are available, plus a wide selection of motor enclosures including the conventional open dripproof, splashproof, totally-enclosed and explosion-proof construction. Foote Bros. Gear and Machine Corp., 4545 S. Western Blvd., Chicago, Ill. and The Louis Allis Co., Milwaukee, Wis.

Platform Truck

Can be adapted to special transporting applications.

This lightweight, battery operated truck is designed for such applications as a welding wagon, plant maintenance truck, personnel car, millwright utility truck, pipefitter's bench, electrician's service car, etc. Over-all length is 104¾ inches. A load area of 20 sq. ft. is obtained with the truck's 56-in. long platform. Platform is 18¼ in. above ground level. Baker Industrial Truck Div., The Baker-Raulang Co., 1250 West 80th St., Cleveland 2, Ohio.

Gas Flowmeter

Indicator below the float permits direct reading of flow rate.

Tapered precision-bore metering tube and float of the variable-area gas flowmeter are fabricated from stainless steel. Metering tube is brazed to the cast iron inlet and outlet fittings, permitting simple and attractive panel installations. The wide-angle scale can be read from within a 180-deg. arc and is rotatable for complete flexibility of installation. Fischer & Porter Co., County Line Rd., Hatboro, Pa.

Roller Chain Assembly

Combines advantages of riveted chain with that of cottered roller chain.

Roller chain assembly consists of a 5 ft. basic length of standard riveted roller chain with a single pin connector assembled at approximately the 2 ft. mark and at the end of the basic 5 ft. length. Connecting link employs one detachable pin and one rivet. It is necessary to remove only one pin to disconnect the chain. There are no other loose parts, since the plates making up the connecting link are all securely press fitted to the remaining rivet. Chain is easy to assemble and disassemble. Baldwin-Duckworth Div., Chain Belt Co., 367 Plainfield St., Springfield 2, Mass.

Fork Trucks

Applicable in plants requiring a truck of 3000-4000 lb. capacity.

All unnecessary frills are omitted, and only those features included that will contribute to efficiency, economy, safety, and operator convenience and comfort in the 3000- and 4000-lb. fork trucks. Frame is

Jones

Herringbone SPEED REDUCERS—

. . . are built in single, double and triple reduction types. Symmetrical gear arrangement provides balanced loads on liberally proportioned bearings. Housings are substantially constructed, well ribbed and have generous pads for foot bolts.

The method of selecting these reducers with complete horsepower and dimension tables is shown in Catalog 70.

Since 1890 Jones In The Service Of Industry

W. A. JONES FOUNDRY & MACHINE CO.
4439 W. Roosevelt Rd., Chicago 24, Ill.

Herringbone — Worm — Spur — Gear Speed Reducers
Pulleys • Gears • V-Belt Sheaves • Anti-Friction
Pillow Blocks • Friction Clutches • Flexible Couplings

Hold Everything!

for every three workers injured on-the-job last year, four were hurt off-the-job

Cartoon-illustrated HOLD EVERYTHING is a sparkling little booklet that covers all these major traffic, pedestrian, and home accidents . . . and at a rock bottom cost. HOLD EVERYTHING costs only a few cents a copy.

HOLD EVERYTHING drives home a serious message . . . with a smile. Takes over where your plant program leaves off. This colorful off-the-job booklet speaks for you . . . with suggestions on swimming, sun-tanning, and just plain "car sense." There is a handy home check list to make those stay at home "vacations" a lot safer. Cut down vacation lost time by ordering copies for each of your workers. Send in your order, today.

QUANTITY PRICES	1 to 9	10 to 99	100 to 999	1000 or more
	$ .12	$ .10	$ .07	$ .055

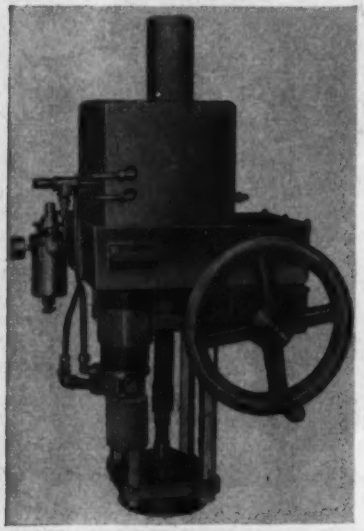
Non-member prices same as member.

NATIONAL SAFETY COUNCIL
425 NORTH MICHIGAN AVENUE, CHICAGO 11, ILLINOIS

unit-welded, heavy-gauge all-steel which contains an integral hydraulic tank. Lift and tilt mechanism is hydraulically operated. Operator sits on left side and cut away design of the dash panel permits unobstructed view of the left side of road at all times. Mechanical brakes of the air-cooled drum type provide positive action with minimum pressure. The Baker-Raulang Co., 1250 W. 80th St., Cleveland 2, Ohio.

Pneumatic Instrument Control

Suitable for use with all commercial pneumatic systems.



With the new Auto-Pneu-Matic control, automatic volume change from zero displacement to full displacement is provided, automatic and in response to instrument air pressure change. This accessory is available for use with all models of Lapp Pulsafeeder proportioning pumps. It makes possible systems in which pump output is made responsive to any measurable variable—flow, *p*H, temperature change, liquid level, pressure, etc. Lapp Insulator Co., Inc., Process Equipment Div., LeRoy, N. Y.

Safety Warning Device

Prevents accidents while working in congested areas around power lines.

The electronic system used in this warning device indicates any failure by flashing a red light in front of the operator of heavy equipment having booms. The device fits any rig, and sounds a loud warning signal each time the boom swings into the vicinity of danger. It is sensitive to voltages from 110 up, and allows proximity warnings from 4 to 200 ft. Rain, ice, and sleet do not interfere with its use. Electro-Alarm Sales Co., 320 WOW Building, Omaha 2, Nebr.

Wet-strengthening Resin

Claimed to supply almost twice as much wet strength than does an equal amount of urea resin.

Though neither a straight urea nor a melamine, Plaskon aminoplast is chemically related to both, and is now in commercial use in a number of paper mills throughout the country. It is being used in paper draperies, diaper stock, kraft bags delicatessen and butcher papers, and toweling. The resin is recommended for headbox addition where it is added to the paper stock before it reaches the fourdrinier wire. Plaskon Div., Libbey-Owens-Ford Glass Co., Toledo 6, Ohio.

Vari-Speed Motordrive Control

Provides a means of obtaining automatic speed changing.

It is possible automatically to control tension, velocity, pressure, temperature, liquid level of materials in process and to synchronize the operating speeds of machines in the production line or of parts of the same machine, with this control on the Motodrive. Actuating force is secured by connecting the control valve lever to any speed indicating mechanism on the driven machine. The Motodrive is a complete variable speed drive which combines motor, speed changing mechanism and gear reducer in one unit. Reeves Pulley Co., Columbus, Ind.

Briefs . . .

▸ ORGANIC SULPHUR COMPOUNDS—A total of 8 sulphur compounds for calibration of analytical instruments and apparatus in laboratories are available as standard samples, namely, Ethanethiol (Ethyl mercaptan), 2-Methyl-2-propanethiol (tert-Butyl mercaptan), 1-Pentanethiol (n-Pentyl mercaptan), 2,3-Tithiabutane (Dimethyl disulphide), and 3,4-Dithiahexane (Diethyl disulphide). Instructions for ordering may be obtained from National Bureau of Standards, Washington 25, D.C.

▸ UNDERFEED OILER — Trico under-feed oilers are intended for lubricating bearings and shafts requiring small amount of oil. Crystal-clear, shatter proof plastic bottle keeps oil suppily visible. Oiler is mounted at the bottom of the bearing, and is easily and quickly installed. Trico Fuse Mfg. Co., 2948 N. 5th St., Milwaukee 12, Wis.

▸ CONTROL STATIONS—Oil-Tite control stations and units are designed for machine tool control and other heavy-duty installations. Five types of operators, with matching pilot lights, provide unit flexibility. Wide variety of contact arrangements is available so control applications of complex nature can be handled. Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.

▸ LOADER AND STACKER—Maquoketa loader is hydraulically operated and controlled. Bucket can be raised, lowered or tripped from any position. Unit can be carried on a truck or trailer, and can be used for handling all kinds of bulk materials and aggregates. Maquoketa fork and stacker lifts 1000 lb. Fork and track tilt forward for loading and unloading. Smooth, surelifting power assured by hydraulic pump operated from motor crankshaft. Maquoketa Co., Maquoketa, Iowa.

▸ CRACK SEALER—For use in sealing windows, transoms, baseboards and holes against cold and to stop drafts, heat losses, dust, dirt, bugs and rattles. Self sealing, non-drying, and permanently pliable. Can be applied, removed for window cleaning or ventilation, and re-applied. Arnaud Corp., 17 John St., New York 7, N.Y.

▸ NON-LUBRICATED CYLINDRICAL VALVE — Non-lubricated cylindrical plug industrial control valve provides leak-proof shut-off while eliminating contamination without the use of lubricant.. Minneapolis-Honeywell Regulator Co., Wayne & Roberts Aves., Philadelphia 44, Pa.

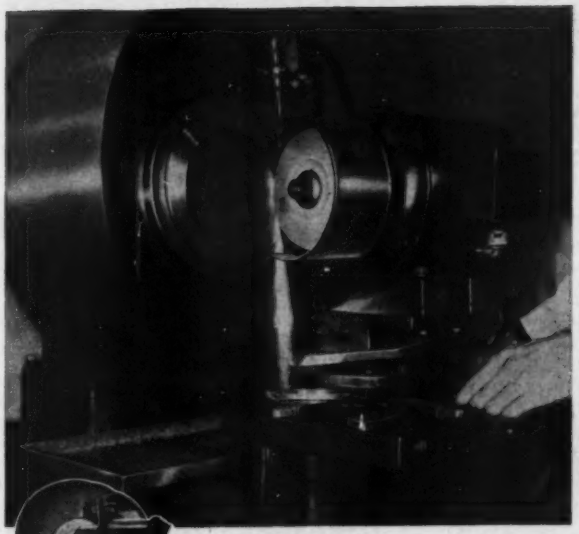
▸ BALL BEARING POWER TRANSMISSION — The Flangette was designed primarily for light duty, slow speed antifriction bearing applications. Light weight, low cost, factory sealed-in lubrication and ease of installation are listed as advantages of this complete unit. The Fafnir Bearing Co., New Britain, Conn.

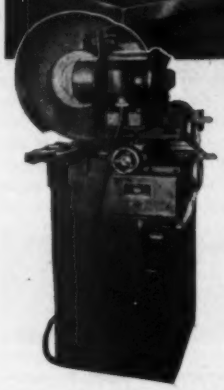
▸ FLEXIBLE METAL CONDUIT—Geon covered flexible metal machine tool conduit may be used for electrical shielding purposes in many applications and is suited for use on machine tools because of its resistance to moisture, coolants, greases and oils. Chicago Metal Hose Corp., 1304 So. 3rd Ave., Maywood, Ill.

▸ PLATFORM TRUCK — Combination steel frame and hardwood-deck platform trucks are available in tilt or level types, with capacities up to 2 tons, depending on running gear. Push handle sockets are inset-welded. Equipped with swivel casters to insure smooth, positive swiveling action. The Rapids-Standard Co., Inc., 342 Rapistan Bldg., Grand Rapids 2, Mich.

▸ MANUAL MOTOR STARTER — Especially suited to controlling and protecting small motors used with fans, pumps, small machine tools, grinders, stokers, etc., the starter fits any standard 2½ inch wall box. Terminals are at the front, with line terminals at top, and load terminals at the bottom. Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.

▸ LOAD-POSITIONING—Hydraulically operated side-shifter attachment can be used with both the Lift Kind and Worksaver fork trucks. Device shifts the forks as much as 4 inches to right or left of center, and makes it possible to "spot" loads in odd corners, close to walls, near pillars, or in other confined transfer and storage areas. The Yale & Towne Mfg. Co., Roosevelt Blvd. and Haldeman Ave., Philadelphia 15, Pa.





It's ROGERS CC-3 for ACCURATE, COST SAVING Circular Knife Grinding

Knives and many types of slitters receive precision care . . . easily, quickly and at less expense . . . when a CC-3 is installed in your own plant. Many adaptations, including magnetic chuck for time saving knife mountings, are available. Write for fully illustrated CC-3 bulletin for complete information.

SAMUEL C. ROGERS & CO.
Mfg. of Knife and Saw Grinding Equipment
165 Dutton Avenue Buffalo 11, N. Y.

MISCO
STAINLESS STEEL CASTINGS
for all equipment exposed to corrosion by sulphite acids or other corrosive agents
MICHIGAN STEEL CASTING CO., DETROIT 7, MICH.

ENGINEER WANTED

Large Western pulp and paper mill manufacturing kraft, groundwood and sulphite pulp and papers and doing extensive converting seeks graduate engineer with 15 to 20 years mill experience gained principally in the pulp and paper business. Initial responsibility would be field supervision of maintenance, construction and shops embracing crew of approximately 300 employees. Successful man could work into plant engineering position within 3 to 4 years. Address: Box 496, The Paper Industry.

German cellulose-chemist seeking opportunity for work in U.S. Who or what firm would like to pay trans-oceanic passage which could be paid back in 12-18 months? I have concluded a 4-year course in electrical engineering and a 4-year technical course in paper-cellulose engineering. Have several years practical experience in sulphite, sulphate, and wood-cellulose techniques, particularly in straw-cellulose plants as factory assistant, factory manager, and plant engineer. I am 37 years old, single, and can speak English. Emigration already approved by U.S. authorities. Address: Box 497, The Paper Industry.

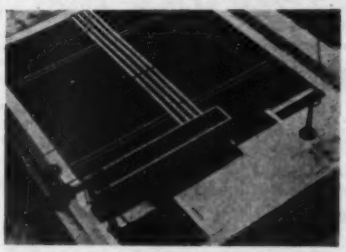
WANTED—Manager of operations for several divisions of a large pulp and paper mill engaged in the manufacture of coated and uncoated papers from soda, sulphite, groundwood and kraft pulps. At least 15 years technical and operations experience in paper industry and 5 years as manager or asst. manager of a mill. Eastern U.S. location. Age 38-45. Salary $15,000-$25,000. Please give complete details. Address: Box 498, The Paper Industry.

SPOTTY PAPER...

can mean "SPOTTY" profits

You may be doing everything you can to assure the high quality of the pulp and paper you produce . . . and yet still be getting troublesome "dark spots" on your product. These spots and speckles that mar even the best products are most often the result of dirt, iron, and other impurities in *process* water.

Make sure of
PAPER QUALITY
with
Permutit Precipitator



Equipment designed to your needs gives you complete control of water quality at all times. Purify the water you use and watch your profit curve prosper! Write to The Permutit Co., Dept. PI-6, 330 West 42nd St., New York 18, N. Y., or to Permutit Co. of Canada, Ltd., 6975 Jeanne Mance Street, Montreal, P. Q.

Permutit®
Water Conditioning Headquarters for Over 37 Years

The Paper Industry New Literature

Books

FOREST PRODUCTS. By J. A. Panshin, E. S. Harrar, W. J. Baker, and P. B. Proctor. Published by McGraw-Hill Book Co., Inc., New York. 6 x 9. 549 pages. $6.00.

Four authorities have collaborated in this volume to present practical and technical information on the sources, production, and utilization of forest products. Divided into the four major sections of (1) economics of forest utilization, (2) wood products, (3) products derived chemically from wood, and (4) derived and miscellaneous wood products, with each of these categories subdivided into as many as six components, the volume places special emphasis on recent developments and trends in the conversion and utilization of forest products. The range of discussion is wide enough to include both Christmas tree growth and marketing and the production of cellulose filaments and film; historical notes make very interesting reading.

A lengthy chapter entitled "Pulp and Paper" gives a good review of the history and mechanics of papermaking. The chapter is illustrated with several photographs and charts including a fold-out diagram of a complete fourdrinier machine. Materials and methods used in papermaking are included in the first part of the chapter; a brief classification of paper products is followed by a more extensive treatment of the geographic factors involved in the manufacture of paper and pulp to conclude the chapter.

Flow charts and diagrams are included wherever needed for complete understanding of complex formulae, and an extensive bibliography follows each chapter. The book is adequately indexed.

HOW TO PLAN PENSIONS . . . A GUIDEBOOK FOR BUSINESS AND INDUSTRY. By Carroll W. Boyce. Published by McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York, N.Y. 480 pages. $5.00.

The necessity for pension planning confronting business and industry today brings problems of administration and negotiation which management is often unprepared to solve. This book has been written to provide background information for the man called upon to discuss pensions and to guide him in his action. It explains business and industrial pension systems, describes cost factors involved, summarizes recent negotiated plans, digests the report of the Presidential steel fact-finders, and includes examples of typical pension plans.

Two special chapters, "The Role of Social Security," by Joseph M. Gambatese and "Communicating with Employees About Pensions," by Fred Rudge and Roscoe C. Edlund, are included as well as discussions of the impact of pensions on collective bargaining and individual firms. An appendix containing such useful information and data as typical pension contracts and a glossary of terms completes the volume.

PRACTICAL REPORT WRITING. By Selby S. Santmyers. Published by International Textbook Co., Scranton 9, Pa. 6 x 9. 118 pages. $2.75.

This book is really a textbook for the men and women who must write reports.

The author, a prominent business educator, deals first with the importance of reports, the background necessary to a writer, ways in which material may be gathered and organized, and writing up a rough draft. After discussing how to shape a report into an understandable and presentable written form, the book reveals means and devices for making a complete report serve the purpose for which it was designed.

Exercises which are keyed to the text material through the work, assignments and summaries help the reader understand the lesson examples which follow. Refresher sections on grammar, vocabulary and word meanings, composition and punctuation, complete the text.

THE FOREMAN'S PLACE IN MANAGEMENT. By T. G. Newton and Bleick von Bleicken. Published by National Foremen's Institute, Inc., New London, Conn. 5¼ x 8½. 160 pages. $2.50.

THE FOREMAN'S PRODUCTION JOB. By A. L. Kress and T. O. Armstrong. Published by National Foremen's Institute, Inc., New London, Conn. 5¼ x 8½. 156 pages. $2.50.

THE FOREMAN'S MANPOWER JOB. By John E. Gagnon and R. E. Verney. Published by National Foremen's Institute, Inc., New London, Conn. 5¼ x 8½. 188 pages. $2.50.

Each volume in this series is divided into two parts—the first a formal presentation of material concerning the part of a foreman's work indicated by the specific book's title, and the second a less formal utilization or illustration of material presented in the first section.

The three phases of the foreman's job indicated in the titles of these books are comprehensively covered; they would be valuable reading for any foreman. The series is interestingly written and cleverly illustrated; charts or diagrams are included only where absolutely necessary, and then are explained completely yet simply.

THE 1950 EDITION PAPER YEAR BOOK. Edited by Anita Reinig. Published by Davidson Publishing Co., 405 East Superior St., Duluth, Minn. 8½ x 11½. 584 pages. $10.00.

The eighth annual edition of the Yearbook has been revised to include all changes in use of paper products since the publication of the seventh edition. More than 1,000 papers, paper products, manufacturers, and paper usages are represented in nine major sections such as wrapping papers, manufacturer's addresses, and paper markets. Each section is thumb-indexed and more than 100 charts, as well as 700 photos, are included. The section concerning papermaking is perhaps too basic to be of interest to papermakers, but might be informative for paper salesmen. The final section, devoted to paper markets, should be of interest to manufacturer and salesman alike.

Each section is arranged alphabetically, with frequent references to further information on subjects listed under a second classification. Three indexes are included—an alphabetical list of products discussed, a listing of manufacturer's addresses, and a final listing of advertisers.

Booklets and Phamplets

PLAN AND CONTROL PRODUCTION. Published by Wallace Clark & Co., Management Consultants, 521 Fifth Ave., New York 17, N. Y. 7 pages. This booklet gives the basic principles of production planning and control in flow, intermittent, and job shop operations, using six charts or sample work sheets as illustrations. While no direct reference is made to pulp or paper manufacture, information given is applicable to the industry.

DATA SHEETS. Published by Pulp & Paper Section Committees of the National Safety Council, 425 No. Michigan Ave., Chicago 11, Ill. Data Sheet D-PP-9, Cutting Paper Cores; Data Sheet D-PP-10, Digesters; Data Sheet D-PP-11, Unfired Pressure Vessels In Pulp Mills (Other than digesters); Engineering Study Pulp & Paper No. 2, Catwalk Across Wet End of Paper Machine; Engineering Study Pulp & Paper No. 3, Report on Use of Sprinklers Under Dryer Hood; Safety Reprint Pulp & Paper No. 1, Fire Prevention on Pulpwood Logging Operations.

ENGINEERING PAPERS OF HYDRAULIC INSTITUTE. Vol. 2. Published by Hydraulic Institute. 90 West St., New York 6, N.Y. 61 pages. $2.00. Four engineering papers on subjects pertaining to pumps, winners of awards in various Engineering Contests sponsored by Hydraulic Institute for employees of its members, are presented in this publication. Papers are Cavitation in

14 MONEL-COVERED ROLLS INSTALLED 14 YEARS AGO... *and Still Going Strong!*

14 is the Lucky WELDCO Number!

● For long service records, you can't top Weldco rolls. These 7 rolls, and 7 others just like them, were installed in 1936 in a Delaware fibre board plant, and they're still on the job! They are cast iron dryer rolls, 36" diameter x 69" face, covered with a solid layer of 16-ga. Monel.

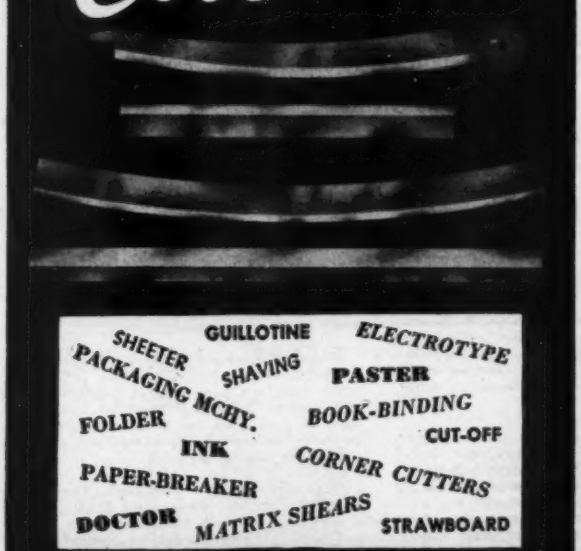
Originally, they were worn cores, corroded by dilute zinc chloride. Now, with corrosion-resistant Monel covers, the rolls are more efficient than when new, for Monel guards against acid attack indefinitely . . . outlasts cast iron many times. In addition, it (1) saves the cost of new cores, (2) eliminates frequent regrinding (reducing "down time"), (3) has practically the same coefficient of heat expansion as cast iron and steel. With this property, there can be no loosening of the cover.

Both new and old rolls can be furnished with wear-resistant, corrosion-resistant Monel covers. Ask any paper machinery builder about them, or contact . . .

THE YOUNGSTOWN WELDING & ENGINEERING COMPANY

3714 OAKWOOD AVENUE . . . . YOUNGSTOWN 9, OHIO

"Coes" KNIVES



SINCE 1830 **Coes** MICRO GROUND

LORING COES COMPANY

WORCESTER • MASSACHUSETTS

GIVING YOU MORE Good Features

- The biggest water users of the nation agree that Layne Well Water Systems and Layne Vertical Turbine Pumps have more good features than any other make. They are more rugged in construction, heavier in production—and cost less to operate, giving years and years of service for the original installation cost. There is a size for every need, custom built for any depth setting. For catalogs or more information address

LAYNE & BOWLER, INC.
GENERAL OFFICES
MEMPHIS 8, TENN.

LAYNE
WELL WATER SYSTEMS
VERTICAL TURBINE PUMPS

Centrifugal Pumps; The Centrifugal Pump in the Process Industries; The Operation of Centrifugal Boiler Feed Pumps; and Submergence for Centrifugal Condensate Pumps.

CURRENT TOPICS IN INDUSTRIAL SAFETY. Vol. 15. Published by National Safety Council, 20 N. Wacker Drive, Chicago 6, Ill. Paper bound. 104 pages. 60c. This is one of 33 volumes included in transactions at the 1949 National Safety Congress, sponsored by the American Society of Safety Engineers, and covers fire prevention, job safety analyses, labor-management and safety, promoting safety training programs, etc.

Manufacturers' Publications

Through the co-operation of manufacturers and suppliers, THE PAPER INDUSTRY *lists the following catalogues, bulletins, and booklets. They may be obtained without cost or obligation, unless otherwise specified, by writing direct to the manufacturers. Please address requests on your company letterhead.*

Lubrication Manuals. Downingtown Mfg. Co., Downingtown, Pa.—No. 350 of this series of four, outlines and illustrates the proper methods of paper machine lubrication with special application for all elements. A two-page Lubrication Schedule covers complete machine parts with recommendations. The other three manuals take up the Lubrication and Maintenance of Downingtown Suction Press, Suction Couch and Suction Drum Rolls, No. 350A; Downingtown Suction Extractor Rolls, No. 350B; and Downingtown Suction Felt Rolls, No. 350C.

Froth Flotation. Denver Equipment Co., Dept. 169, Denver 17, Colo.—4-page Bulletin No. F10-B46 discusses examples of separating near-colloidal size particles from a saturated brine; fractionation of fine clays; recovery of fossil resin from coal; cleaning peas and wheat; water purification; and correcting stream pollution. Potential uses for flotation are mentioned. Illustrated.

Truck-Mounted Shovel-Cranes. Link-Belt Speeder Corp., Cedar Rapids, Iowa—Catalogue No. 2322 contains applications, construction details, customer benefits and specifications of the new HC-51 truck-mounted shovel-crane with Speed-o-Matic hydraulic controls. Illustrated.

Mixing Equipment. Patterson Foundry and Machine Co., East Liverpool, Ohio—4-page bulletin includes detailed information on Patterson dispersion mixer for industrial finishes and Patterson general purpose mixer for industrial and chemical engineering. 8-page general catalogue includes photographs and operating details on Patterson Kneadermaster mixers. Described also are double-arm horizontal mixer, tilting type vacuum mixer, non-tilting bottom-discharge mixer, dispersion-type mixer, a sigma blade mixer and three laboratory mixers.

General Purpose Hoists. American Hoist & Derrick Co., 63 S. Robert St., St. Paul 1, Minn.—2 catalogues cover the line of general purpose hoists. Catalogue No. 100-H-40 covers American general purpose hoists from 5 to 40 hp. Catalogue No. 100-H-55 covers American hoists from 50 to 100 hp. Specifications included. Illustrated.

Management Appraisal. Wallace Clark & Co., 521 5th Ave., New York, N. Y.—4-page folder entitled "The Management Audit—An Appraisal of the Dynamics of a Company" contains a statement of what the Management Audit is, why it is made, how it is made, and what its benefits are to management.

Chlorine Dispenser. Fischer & Porter Co., 61 County Line Rd., Hatboro, Pa.—8-page Catalogue 61 illustrates and describes self-contained cabinet-type chlorine dispensers with capacities of 1 lb. to 1200 lb. of chlorine per day, and systems with unlimited dispensing capacity. Included are schematic drawings, capacities, and a page of other equipment manufactured by this company.

Alarm Signal System. Panalarm Products, Inc., 7218 No. Clark St., Chicago 26, Ill.—4-page Bulletin No. 400 contains descriptive information about Series 400 Panalarms, the universal safe multiple signal for hazardous and corrosive atmosphere. Illustrated.

Mobile Cranes. Coles Cranes, Inc., 4312 So. Paulina St., Chicago, Ill.—8-page bulletin briefly describes and illustrates the various models of mobile cranes. Specifications and duties of each model are given.

Filing Room Equipment. Hanchett Mfg. Co., Big Rapids, Mich.—Booklet contains 13 photo illustrations of saw and knife sharpening applications in a modern saw mill. Photograph of the Hanchett plant, including machine shop and assembly line, is included.

Fork Lift Trucks and Towing Tractors. Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.—8-page general catalogue provides pertinent facts to a preliminary consideration of materials handling machines. Sketches of both gas-powered and electric units are shown. Included are dimensional and specification tables.

Automatic Valve Specialities. Davis Regulator Co., 2541 So. Washtenaw, Chicago, Ill.—Condensed Catalogue A-50 contains Bulletin No. 100A describing pressure regulators, altitude valve, pump governors and strainers; Bulletin No. 101B describing lever, float and motor operated valves, pilot valves; Bulletin No. 101A describing back pressure, relief and non-return valves, and steam trip and air vent; Bulletin No. 10, liquid level controllers; Bulletin No. 81, solenoid valves; Dia-ball unit bulletin, dia-ball unit and applications; and, technical data which includes capacity charts. Illustrated with schematic drawings. Includes price lists and dimensional tables.

Thermoplastic Sheet Lining. Maurice A. Knight, Kelly Ave., Akron 9, Ohio—4-page Bulletin No. 2N contains information on pyroflex, an acid proof and corrosion resistant sheet lining for application to steel, concrete, masonry, ceramic or glass surfaces. Illustrated with dingrammatic sketches and construction photographs. Typical installations are cited.

Dry-Type Transformer. Allis-Chalmer Mfg. Co., Milwaukee, Wis.—8-page Bulletin 61B-6382A describes and illustrates dry-type transformers for duty right at the load center. Electrical and mechanical data on the transformers is included.

Corrosion Resistant Cement Chart. Special Chemicals Dept., Pennsylvania Salt Mfg. Co., 1000 Widener Bldg., Philadelphia 7, Pa.—Complete chart shows resistance of Pennsalt PRF, Asplit, Causplit, Pennsalt HF, and Penchlor Acid Proof Cement to a list of 259 chemicals and chemical compounds from acetaldehyde to zinc sulphate.

Bronze Valve. Manning, Maxwell & Moore, Watertown 72, Mass.—2-page self-mailer folder describes and illustrates the Hancock 150# Bronze Valve for general services within the pressure scope. Dimensional table given.

Swivel Joints. Chicksan Co., 330 N. Pomona Ave., Brea, Calif.—28-page loose leave folder-type Catalogue No. 50 illustrates and describes over 500 different types and sizes of ball-bearing swivel joints. Included are unions, blocks and thread compounds manufactured by the Well Equipment Mfg. Corp., subsidiary of Chiksan Co., as well as the low pressure gas burners and warehouse and derrick stoves manufactured by Anchor Burner Co.

Steam Generators. Foster Wheeler Corp., 165 Broadway, New York 6, N. Y.—12-page Bulletin PG-49-13 describes and illustrates with dimension drawings and cross-sectional views the package steam generators for power or process steam at high or low pressure in stationary or marine installations. Performance curves and dimensional tables for different types of boilers are included.

Measuring Instruments. Fischer & Porter Co., 75 County Line Rd., Hatboro, Pa.—24-page catalogue describes and illustrates Levelimeter instruments for indicating, measuring and controlling liquid level and inter-face level. Schematic sketches are shown.

Roller Chains. Chain Belt Co., 1600 W. Bruce St., Milwaukee 4, Wis.—4-page Bulletin No. 49-3 describes and illustrates Baldwin-Rex double pitch roller chains for power transmission and conveying service. A table on dimensions, weights and strengths is included with list prices.

Industrial Gloves. B. F. Goodrich Co., Akron, Ohio—4-page Bulletin 9035 is a catalogue section devoted to industrial and acid gloves treated with the anode process. Illustrated.

Lift Trucks. Hyster Co., Portland 8, Ore.—8-page booklet No. 1135 contains model views, action photographs and descriptive text on the 2000 lb. capacity lift truck (Model 20). Specifications and details are included.

Floor Resurfacer. Flexrock Co., Filbert and Cuthbert, West of 36th Philadelphia 4, Pa.—3-way folder describes Ruggedwear, a material processed to a secret formula and added in prescribed proportions to a specific concrete mix for floor resurfacing. A cross-section of the product's users is given. Photographs of application are shown.

Hydraulic Equipment. Blackhawk Mfg. Co., Milwaukee 1, Wis.—4-page Bulletin No. 50B describes complete line of hydraulic Porto-Power equipment for installing pipe and conduit. Illustrated.

Electricians Gloves. The B. F. Goodrich Co., Akron, Ohio—2-page Catalogue Section 9036 describes construction of gloves made by the anode process, defines the high voltage resistance for each type, and includes specifications on each of the types. Illustrated.

Leak Detector. Consolidater Engineering Corp., 620 No. Lake Ave., Pasadena 4, Calif. 16-page two-color catalogue describes the Consolidated leak detector. A large section is devoted to applications and leak detection methods used in both vacuum and pressure systems. Examples of both Probe and Envelope techniques are discussed and accompanying schematic diagrams show testing equipment necessary. Operation, performance, and features of the instrument are described. Accessories, spare parts and specifications are listed.

Waxer and Water Finish Attachment. Dilts Machine Works, Fulton, N. Y.—8-page Bulletin No. 1-DM describes the Miami Lo-Type Waxer and Water Finish Attachment together with Kohler winding equipment, the latter being adapted for use with the waxing machine. Drawings and photographs illustrate construction and operation of the waxing system which can be used for both wet and dry wax processing. Typical arrangement sketches are shown.

Vacuum Hose. The B. F. Goodrich Co., Akron, Ohio—4-page Catalogue Section No. 4780 describes and pictures construction of the various lines and types of hose which handles dust, abrasive scrap and toxic fumes in many industries. Recommended uses and specifications are included.

Viscosity Control. Brookfield Engineering Laboratories, Inc., Stoughton, Mass.—4-page data sheet describes the Viscotrol, a new instrument unit which can be engineered into production systems to provide continuous and automatic viscosity control. Illustrated with photograph and typical viscotrol installations. Construction and operating details are given.

Lift Trucks and Tractors. Towmotor Corp., 1226 E. 152nd St., Cleveland 10, Ohio—4-page Job Study No. 89 presents a detailed outline of handling methods practiced at The Pfaudler Co., Rochester, N. Y. Photographs of

Federated first for Lead Products

Asarco Sheet Lead... All commercial weights and sizes. Chemical...Tellurium Chemical...Antimonial.

Asarco Lead Pipe... All commercial sizes. Special sizes on request. Chemical...Tellurium Chemical...Antimonial.

Asarco Lead and Lead Lined Valves
... Split Type "Y" and "Angle", Standard "Y", Gate, Check, Hard Lead "Y", Plug and Seat.

Asarco Lead Fittings... Elbows, Crosses, Tees, "Y's", (with plain ends, with flanges on, or for flanging in the field). Chemical and Antimonial.

Asarco Lead Wool... 5/8" rope in 50 lb. waterproof bags.

Asarco Lead Specialties... Extrusions and Castings to specification.

See Federated also for Lead Lined Pipe Lead Lined Fittings, Lead Lined Flanges

Federated Metals Division
AMERICAN SMELTING AND REFINING COMPANY,
120 BROADWAY, NEW YORK 5, N. Y.

Federated first in the non-ferrous field

SULPHITE MILL ACID PLANTS

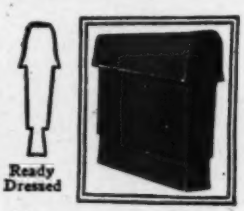
SULPHUR BURNING PLANTS
JENSSEN TWO TOWER ACID SYSTEMS
GAS COOLERS—SURFACE AND SPRAY TYPE
JENSSEN PRESSURE ACID SYSTEMS
JENSSEN AUXILIARY PROCESS TOWERS
RECOVERY PLANTS—COOKING ACID
SOLUBLE BASE ACID PLANTS
SEMI CHEMICAL PLANTS
JENSSEN SO_2 ABSORPTION SYSTEMS
FOR BLEACH PLANT APPLICATION
SULPHUROUS ACID PREPARATION

G. D. JENSSEN CO. INC.
WATERTOWN, NEW YORK
WESTERN REPRESENTATIVE:
A. H. LUNDBERG, 308 Orpheum Building, Seattle, Washington
FOUNDED 1915

"READY DRESSED" MILL COGS

LABOR SAVING — TIME SAVING

The Most Economical Filling That Can Be Put In a Mortise Wheel.



We Make Any Style or Size Wanted.

Write for Instruction Sheet "O" Which Is Free.

QUICK SERVICE ON ALL SIZES

THE N. P. BOWSHER CO., South Bend, Ind.

For Paper-Making...

Quality Chemicals

PLUS!

When you specify SOLVAY for your paper-making chemicals . . .

You get the benefit of SOLVAY's long experience as a manufacturer of chemicals for paper making. SOLVAY has worked with paper makers for more than five decades—longer than any other alkali manufacturer!

You get prompt delivery of the chemicals you need from one of the huge SOLVAY plants or from a near-by warehouse.

And—you get the valuable services of the skilled paper experts who are part of SOLVAY Technical Service . . . men who know your industry and its problems.

All this—plus the traditional quality which SOLVAY puts into every product—is yours when you specify SOLVAY.

SOLVAY

LIQUID CHLORINE
CAUSTIC SODA
SODA ASH

Soda Ash • Caustic Soda • Caustic Potash • Chlorine • Nytron
Potassium Carbonate • Calcium Chloride • Sodium Bicarbonate
Specialty Cleansers • Ammonium Bicarbonate • Sodium Nitrite
Para-dichlorobenzene • Ortho-dichlorobenzene • Formaldehyde
Monochlorobenzene • Methanol • Ammonium Chloride

SOLVAY SALES DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

BRANCH SALES OFFICES:
Boston • Charlotte • Chicago • Cincinnati
Cleveland • Detroit • Houston • New Orleans • New York
Philadelphia • Pittsburgh • St. Louis • Syracuse

WALLACE CLARK & COMPANY
MANAGEMENT CONSULTANTS
Since 1920
SPECIALISTS IN PAPER MILL MAINTENANCE
Information on request
521 FIFTH AVENUE — NEW YORK 17, N.Y.

W. B. COHAN
Consulting Engineers
624 S. MICHIGAN AVE.
CHICAGO 5, ILLINOIS
Structural, Mechanical and Electrical Design for the Construction and Maintenance of
PAPER AND PULP MILLS
PROCESSES PIPING PLANT LAYOUT

ARTHUR C. DRESHFIELD, Ch. E.
CONSULTANT
Research . . . Development . . . Control
Market Research
Laboratory Investigations thru affiliation with
Chicago Testing Laboratory
536 Lake Shore Drive, Chicago 11, Illinois

FREDERICK WIERK, P.E.
CONSULTING ENGINEER
P.O. BOX 492 GREAT NECK, N.Y.
Reports and Designs for Construction or Modernization of Pulp & Paper Mills, Steam and Hydro Power. Stream Pollution Abatement.

actual application of the Towmotor trucks and four of the units used by the company are included.

Sprockets. Chain Belt Co., 1600 W. Bruce St., Milwaukee 4, Wis.—16-page Bulletin No. 49-30 describes the Rex stock size cast sprockets for the complete line of Rex drive and conveyor chains. Dimensions, specifications, list prices, sprocket style and other necessary information are included.

Dust Collectors. Prat-Daniel Corp., East Port Chester, Conn.—16-page Catalogue No. 250S furnishes information on the high narrow inlet slot, a feature of the Valmont Type S Dust Collector. Also described are internal changes and proportionate dimensional revisions of the tube. Monograph chart for determining number of tubes required for a given capacity, temperature and resistance, followed by tables for determining dimensions of the collector for any number of required tubes are included.

Shock Absorbers. R-S Products Corp., 4530 Germantown Ave., Philadelphia 44, Pa.—2-page loose leaf Bulletin No. 38 describes and pictures compact shock absorbers and excess pressure eliminators for eliminating hydraulic shock and hammering in pipe lines carrying water or petroleum products.

Worm Gear Speed Reducers. De Laval Steam Turbine Co., Trenton 2, N. J.—28-page Bulletin G-WB contains a complete description of standard IMO-De Laval horizontal worm gear speed reducers. Shows available types and gives standard specifications. Included are horsepower rating tables, overhung load ratings, dimension tables and information on how to select worm gears.

Electronic Spacer. E. P. Lawson Co., 426 West 33rd St., New York, N. Y.—4-page bulletin describes and illustrates the electronic spacer cutter and includes specifications.

Stock Makers. Morden Machines Co., Pacific Bldg., Portland 4, Ore.—12-page Bulletin MM200 describes the Stock-Maker for continuous beating and refining. Distinctive features are given. Included are descriptive flow diagrams, and specifications.

Fireclay Brick. Laclede-Christy Co., 200 Iroquois Bldg., 3600 Forbes St., Pittsburgh 13, Pa.—3-way Bulletin No. 202 describes and illustrates dry press fire brick. Specialties table contains list of products of plastics, castables and coatings together with their uses.

Charge Control Unit. The Hertner Electric Co., 12690 Elmwood Ave., Cleveland 11, Ohio —2-page looseleaf Bulletin No. 201 describes and illustrates the double duty charge control unit for automatically charging two batteries from a single circuit motor generator battery charger. Parts identification picture shown.

Combustion Safeguard. Wheelco Instruments Co., Chicago 7, Ill.—4-page Bulletin No. F2-1 describes the economy and safety features of the Flame-otrol combustion safeguard for oil and gas fired furnaces, ovens, boilers, kilns and other heating equipment. Illustrated with pictures and a typical application diagram.

Pipe Fittings. McGriff-Streed Fabricating Co., 1625 Bell St., Montgomery, Ala.—15-page brochure covers dimensional and descriptive data on transite lined pipe fittings. Illustrated are valve, flanges, 90 deg. elbows, tees, special fan pump fitting, crosses and 45 deg. elbows.

Vinyl Coatings. Gates Engineering Co., P. O. Box 1711, Wilmington, Del.—4-page brochure describes many of the industrial maintenance and marine applications of the Gaco vinyl finishes and coatings. Other products of this company are briefly described.

Steel Casting Reference Chart. Lebanon Steel Foundry, Lebanon, Pa.—2 reference charts cover 33 selected grades of carbon and low alloy, stainless, corrosion—and heat-resistant alloys. Incorporated in the charts is detailed reference material on specification designations, analyses, physical properties, heat treatments and related data on 18 high alloys and 15 low alloys and carbon steels.

Flooring. Ralph V. Rulon, Inc., 3900 N. 2nd St., Philadelphia 40, Pa.—8-page bulletin contains information on asphalt Mastic floors, together with specifications, and photographs of applications.

Chlorine Reference Book. Diamond Alkali Co., 300 Union Commerce Bldg., Cleveland 14, Ohio—44-page, file size, technical manual describes and illustrates three approved, standard-size cylindrical containers used to package Diamond liquid chlorine for rail and truck shipment. Data on proper service tools, equipment and accessories, typical installations, and first aid measures, gas masks, and emergencies are discussed. Second section of the book is devoted to the physical properties of chlorine and includes 8 charts and tables covering enthalpy, vapor pressure, density, specific volume, etc.

Centrifugal and Piston Pumps. Condenser Service & Engineering Co., Inc., 95 River St., Hoboken, N. J.—24-page bulletin describes and illustrates centrifugal and piston pumps for marine and industrial use such as circulating service, boiler feed, bilge, drainage, water supply, booster, and various distillery and chemical plant duties. Cross section drawings and tables of sizes are included.

Rotameters. Schutte and Koerting Co., 12th and Thompson Sts., Philadelphia 22, Pa.—Bulletin 18-RB pictures and describes the complete line of Universal Rotameters, utilizing the high capacity fluted Rotameter tube. Sizes and dimensions are included with information on the application, construction and operation of this equipment.

Roof Protection. United Laboratories, Inc., 16801 Euclid Ave., Cleveland, Ohio—4-page folder entitled "Protect that Roof . . . it's good insurance" describes causes for most roof troubles and explains tested methods to combat the havoc caused by roof structure movement, sun, wind, rain and snow. Also describes methods of eliminating difficulties in vital areas such as flashings, laps, seams and coping stones.

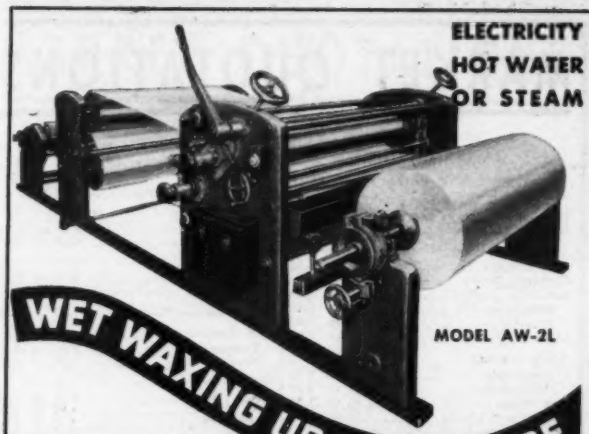
Steel Shaft Data. De Laval Steam Turbine Co., Trenton 2, N. J.—20-page Bulletin G-7 contains formulae, curves and tables that will materially assist designers in determining proportions, stresses, combined torsional and bending loads, etc. in round, square, hollow, keyway and steeped shafts.

Propionitriles. New Product Development Dept., American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y.—Bulletin No. 12 contains physical and chemical properties of four beta substituted propionitriles, (three of which are new products) B-dimethylaminopropionitrile, B-isopropylaminopropionitrile, B-methosypropionitrile, and B-isoproposypropionitrile.

Paper Screens. Bird Machine Co., South Walpole, Mass.—8-page Bulletin describes and illustrates with installation photographs the Bird screens. A flow diagram is included.

Recording Controller. Wheelco Instruments Co., 847 W. Harrison St., Chicago 7, Ill.—2-page data sheet describes and illustrates the pneumatic capacilog, an air-operated strip chart recorder for use in applications where electric contactors or motors would create a hazard, or where fixed position changes in regulated medium or fuel supply may be injurious to the work in process.

Steam Jet Air Ejectors. Condenser Service and Engineering Co., Inc., Hoboken, N.J.—12-page Bulletin describes and pictures steam jet air ejectors for air removal from condensers. Engineering data includes charts, temperature conversion and pressure conversion tables.



ELECTRICITY
HOT WATER
OR STEAM

MODEL AW-2L

WET WAXING UP TO 80" WIDE

A new model Wet Waxer . . . featuring compact construction, functional flexibility of use, high speed, and electric, hot water or steam heating. Built in widths from 10 to 80 inches. Other models available for dry or contact waxing. Write for further information.

HUDSON-SHARP
MACHINE CO • GREEN BAY • WIS

ANILINE *Print* PRESSES

PERFECT REGISTER
. . . TREMENDOUS SPEED

THIS brand new No. A-4 aniline printing press offers perfect register at highest speeds on cellophanes, foils, and other materials your customers require for wrapping their products. Many other models in our complete line of presses are available for the aniline printer. Write us for complete detailed descriptions.

HUDSON-SHARP
MACHINE CO • GREEN BAY • WIS

and move them *faster* and *more economically* than any other method.

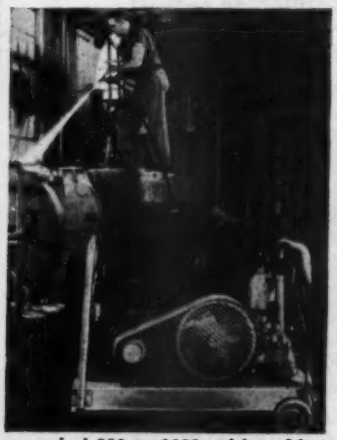
Owen engineers complete grapple handling systems to meet your requirements.

Former users of the old style "sling system" now attest to claims of up to 75% reduction in labor with Owen Pulpwood Grapple Systems. Write for details TODAY.

OWEN PULPWOOD GRAPPLES FOR HANDLING LOGS

THE OWEN BUCKET CO.
6015 BREAKWATER AVE. • CLEVELAND, OHIO
BRANCHES: NEW YORK • PHILADELPHIA • CHICAGO • BERKELEY, CALIF.

"SCREEN CLEANING TIME
Cut from *Hours* to *Minutes!*"



"This Farquhar Hi-Pressure Cleaning Unit is of inestimable value to our Paper Mill!" *says* H. D. Schmidt, *President*, Schmidt & Ault Paper Co.

Here's a time-saving, money-saving, *completely portable* High Pressure Cleaning Unit that does a *better* job of cleaning screen slots on Bird screens, washing out holes on suction couch and press rolls, removing white scale and other incrustations from vats, quick cleaning of Fourdrinier after wire is removed! Cleans walls, floors and equipment faster, easier! 300 to 1000 psi-jet of hot or cold water washes away refuse, residue and debris without harming machinery. Praised by users everywhere for its efficiency, portability and ease of operation! Two sizes . . . 10 gal. per minute pump with 1 gun or 20 gal. per minute with 2 guns.

WRITE FOR DETAILS! Find out *now* how you can save time, labor, money! Write to:
A. B. FARQUHAR CO., *Special Machinery Division*, 1217-E Duke St., York, Pa.

Farquhar
HI-PRESSURE CLEANERS
JUICE PRESSES • SPRAY COOLERS
PASTEURIZER COOLERS • CONVEYORS
TRIMMING TABLES • HYDRAULIC PRESSES

BRAMMER
RECORDING CONSISTENCY CONTROL

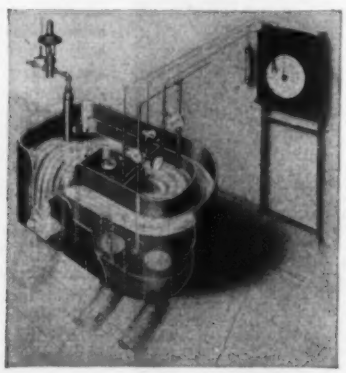
OVER 155
SUCCESSFUL OPERATING UNITS IN THE PULP AND PAPER INDUSTRIES

For accurate regulation of consistency, and recording both before and after diluting water has been supplied.

Year after year, more and more pulp and paper mills install BRAMMERS for better control and uniformity. And repeat orders evidence the satisfactory operating results. Sixty percent of total Brammer purchases during the past two years represented repeat orders from mills keeping pace with the trend of increased production, improved quality and lower costs.

Because the BRAMMER offers the most accurate and dependable record and control of stock consistencies, its many operating and economy advantages merit your investigation.

16-page Catalog on request



Patented and Patents applied for in U.S.A. and Foreign Countries

Manufactured and sold in Canada by Alexander Fleck Limited, Ottawa, Ontario

PAPER and INDUSTRIAL APPLIANCES
Incorporated
122 East 42nd Street, New York, N. Y.

MARKET QUOTATIONS

RAGS (Domestic)

NEW RAGS

Quotations to consuming mills, cents per pound or dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.
Blue Overalls	7.00 to 7.25
Corduroy, Men's	3.75 to 4.00
Corduroy, Ladies'	3.75 to 4.00
Washables, No. 1	3.00 to 3.25
Percales	6.00 to 6.25
Light Prints, No. 1	5.75 to 6.00
Khaki Cuttings—	
Bleachable	4.50 to 4.75
Unbleachable	4.00 to 4.25
New White Canvas	11.00 to 11.50
New Mixed Blacks	3.50 to 3.75
Canton Flannels, Bleached	10.75 to 11.00
Shirt Cuttings—	
New White No. 1	11.00 to 11.25
White Shrunk	10.25 to 10.75
Silesias No. 1	7.50 to 7.75
New Unbleached	11.00 to 11.25
Fancy	5.25 to 5.50
Linen Cuttings—	
American	8.00 to 8.25
White	14.00 to 15.00
Grey	13.50 to 14.00

RAGS (Domestic)

OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.
Roofing—	
No. 1	1.30 to 1.40
No. 2	1.20 to 1.30
No. 3 and No. 4	1.00 to 1.10
Twos and Blues—	
Repacked	2.50 to 2.75
Thirds and Blues—	
Repacked	2.25 to 2.50
Miscellaneous	1.75 to 2.00
Whites, No. 1—	
Repacked	4.25 to 4.50
Miscellaneous	3.00 to 3.25
White, No. 2—	
Repacked	3.00 to 3.25
Miscellaneous	2.50 to 2.75

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)

ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shopperies	

ROPE and BAGGING

f.o.b. and ex dock New York City

	per cwt.
Gunny No. 1—	
Foreign	5.75 to 6.00
Domestic	6.50 to 6.75
Wool Tares—	
Light	6.50 to 7.00
Heavy	7.00 to 7.50
No. 1 Scrap Bagging	5.25 to 5.50
Manila Rope—	
No. 1 large	5.50 to 5.75
No. 1 small	4.50 to 4.75
Sisal Rope—	
No. 1 large	5.00 to 5.25
No. 1 small	4.50 to 4.75
New Burlap Cuttings	6.75 to 7.25
Jute Threads—	
Foreign (Nom.)	6.50 to 7.00
Domestic	6.00 to 6.50
Strings—	
No. 1 sisal	4.50 to 4.75
No. 2 sisal	4.00 to 4.25
Soft jute	4.25 to 4.50
Mixed	2.50 to 2.75

WASTE PAPER

The following are quotations, dollars per ton, for No. 1 packing f.o.b. New York:

Shavings—	per ton
Hard White Env. Cuts.	95.00 to 100.00
Hard White, No. 1	75.00 to 80.00
Soft White No. 1	65.00 to 70.00
Soft White, one-cut	85.00 to 90.00
Soft White, Misc.	60.00 to 65.00
Fly Leaf, No. 1	30.00 to 32.50
Fly Leaf, Woody No. 1	22.50 to 25.00
No. 2 Mixed Col. Woody	17.50 to 20.00
Flat Stock—	
No. 1 Heavy Books and Magazines, Repacked	24.00 to 25.00
Mixed Books	12.00 to 13.00
Ledger Stock—	
No. 1 white	40.00 to 45.00
No. 1 Mixed (Colored)	32.50 to 35.00
Manilas—	
New Env. Cuttings	60.00 to 65.00
New Env. Cuts. One-Cut	—
Extra Manilas	35.00 to 40.00
Manila Tab Cards, Free of Ground Wood	65.00 to 70.00
Colored Manila Tab Cards	35.00 to 40.00
Kraft—	
New Envelope Cuttings	60.00 to 65.00
Tripled Sorted No. 1 100%	30.00 to 35.00
New 100% Cor. Cuts	30.00 to 35.00
No. 1 Old Assorted	25.00 to 27.50
News—	
White Blank	55.00 to 60.00
Overissue	15.00 to 16.00
No. 1 Folded	10.00 to 11.00
Old Corrugated Containers	16.00 to 17.00
New Jute Corrugated Cuts.	20.00 to 22.00
Mill Wrappers	10.00 to 11.00
Box Board Chips	7.00 to 8.00
No. 1 Mixed Paper	7.00 to 8.00

CHEMICALS

f.o.b. shipping point

Alum (Papermakers)—	
Lump, cwt.	4.05—
Ground, cwt.	3.80—
Powdered, cwt.	4.20—
Blanc Fixe—	
Pulp, bulk, ton	80.00—
Dry, barrels	85.00—
Bleaching Powder—	
Drums, cwt.	4.50 to 5.00
Casein (Domestic Standard)	
20-30 mesh (bags), lb.	
80-100 mesh (bags), lb.	23.00 to 24.00
Argentine, lb.	20.50 to 21.00
China Clay—	
Domestic Filler	
Bulk (mine) ton	10.00 to 15.00
Domestic Coating	
Bulk (mine) ton	15.00 to 25.00
Imported (ship side)	
Bulk (lump) ton	32.00 to 36.00
Chlorine—	
Tank cars (wks) cwt.	2.40 to 2.70
Gelatine (silicin), lb.	1.35 to 1.35
Glyc. (C.P.) drums, lb.	.24¾ to .25¼
Litharge, powd. bbl. lb.	.12½ to .13
Rosin (Gum)—	New York, per 100 lbs.
E	6.20—
F	6.20—
G	6.20—
WW	6.50—
Rosin (Wood), carlots, F.O.B. South	5.00—

MARKET QUOTATIONS

Salt Cake—
Dom. bulk (wks) ton..... 22.00 to 24.00
Imp. bulks on dock—
(Atl. ports) ton (Nom.) 25.00—

Soda Ash—
Bulk (works), cwt..... 1.00 to 1.15
Paper Bags, cwt. ..... 1.25 to 1.35

Soda (Caustic)—
Solid drums, cwt. ..... 3.05 to 3.10
Ground and flake, drums, cwt. ..... 3.45 to 3.50

Sodium Silicate—
60 deg. 55 gal. drums, (works) cwt. ..... 1.25 to 1.50
40 deg. 35 gal. drums, (works), cwt. ..... .80 to 1.05

Starch—
Pearl, 140 lb. bags, cwt... 4.87—
Pearl, barrels, cwt..... 4.87—
Paper, (Sp.) bags, cwt..... 4.87—
Powdered, barrels, cwt..... 4.98—

Sulphur (Crude)
(Mine) bulk, long ton..... 18.00—

Talc—
Dom. 100 lb. bags (mine) ton ..... 22.00 to 28.00
Canadian ..... 35.00 to 45.00

Titanium Dioxide—
Barium Pig, bbls., lb..... .19½ to .21
Calcium Pig, bbls., lb..... .19½ to .21

Zinc Sulphide, bbls., lb. ..... 11.5u to 11.75

WOOD PULP

Prices, dollars per short, air dry, ton, with inland freight allowed, are:

Bleached sulphite, Swed... 118.00—
Bleached sulphite, Finnish..118.00—
Bleached sulphite, dom..... 118.00—
Easy bleaching sulphits.... —
Unbleached kraft, Finn..... —
Unbleached sulphite, Swed. 100.00—
Unbleached sulphite, Fin... —
Unbleached sulphite, dom. 100.00—
Unbleached kraft, Swedish 82.50—
Unbleached kraft, northern 82.50—
Unbleached kraft, southern 80.00—
Bleached sulphate, Swedish 126.00 to 128.00
Bleached soda, domestic.... 115.00—
Sulphite screenings, dom. 40.00 to 50.00
Sulphate screenings, dom. 40.00 to 50.00
Groundwood, domestic and Canadian ..... 65.00 to 67.50

PAPER

f.o.b. New York City

Boards— per ton
Binders ..... 100.00—
Chip ..... 70.00—
Chip, tube and can..... 75.00—
Chip, full blending..... 77.50—
Chip, sgl. mls. lined..... 77.50—
Coated, white patent
.018 ..... 110.00—
.020 and heavier..... 100.00—
Kraft liner ..... 95.00 to 100.00
Filled News ..... 72.50—
Container ..... 85.00—

Book Papers—f.o.b. mill with quantity, weight, manufacturing and other differentials allowed:

(Per cwt. in ton lots)
Uncoated (Untrimmed)

Book, White (M. F.)—
A Grade E. F..... 15.65—
B Grade E.F. ..... 14.90—
A Grade S. C. ..... 15.90—
B Grade S. C..... 15.40—
No. 2 Uncoated Offset 4 sides, White —
Machine Coated White (Trimmed 4 sides)
No. 1 Glossy..... 19.75—
No. 2 Glossy..... 19.25—
No. 3 Glossy..... 17.75—
No. 4 Glossy..... —
No. 2 Offset..... 15.15—
C1S Litho (Varnish)..... —
C1S Litho (Non-Varnish)..... —

Writing Papers—f.o.b. mill with zone, quantity, packing and other differentials allowed:

Rag Content Bond—
(In Ton Lots)
per cwt.
Extra 100% Rag ..... 54.45—
100% Rag ..... 47.05—
75% Rag ..... 36.15—
50% Rag ..... 29.40—
25% Rag ..... 25.75—

Rag Content Ledger—
(In Ton Lots)
per cwt.
Extra 100% Rag ..... 55.70—
100% Rag ..... 48.30—
75% Rag ..... 37.65—
50% Rag ..... 30.70—
25% Rag ..... 27.80—

Sulphite Bond—
per cwt.
Air dry, watermarked ..... —
No. 1 watermarked..... 17.70—
No. 2 watermarked..... 16.75—
No. 4 watermarked..... 15.75—

Sulphite Ledger—
per cwt.
No. 1 watermarked..... 19.00—
No. 2 watermarked..... 18.20—
No. 4 watermarked..... 17.65—

Glassine (f.o.b. mill)—
per cwt.
Embossed (25 lb. up)..... —
Bleached (25 lb. up)..... —
Unbleached (25 lb. up)..... —
Greaseproof—
Bleached (25 lb. up)..... —
Unbleached (25 lb. up)..... —

News—
per ton
Rolls, Standard Contract) ..... 100.00 to 103.00
Rolls (Spot) ..... (Nominal)
Sheets ..... 119.00—

Tissues (Carlots)—
per ream
White No. 1..... 1.55—
White No. 2..... 1.20—
Bleached Anti-Tarnish..... —
Colored ..... —
Anti-Tarnish Kraft..... 1.37½—
Manila ..... 1.60—
Napkins, semi-crepe (12½ lb. to M shts.) per cs. ..... .80—
Napkins, full crepe and emb'sed (12½ lb. to M shts.) per cs. ..... .80—
Toilet, Bleached (M. shts.) per cs..... 6.95—
Toilet, Unbleached (M. shts.) per cs..... 5.75—

Towels—
per case
Bleached ..... 5.25—
Unbleached ..... 4.50—

Wrappings (Kraft)—
per cwt.
Super-Standard ..... 8.00 to 8.50
No. 1 Wrapping..... 7.25 to 7.50
Standard Wrapping..... 6.50 to 6.75
Standard Bag ..... 6.25 to 6.50
Variety Bag..... —

Wrappings (Sulphite and Bleached Kraft)—
(Rolls, f.o.b. mill)

Bleached Papers—
per cwt.
M.F. & M.G. Waxing, 20 lb. (Carloads only) —
(10,000 lb.) ..... —
Drug wrapp., 35 lb..... —

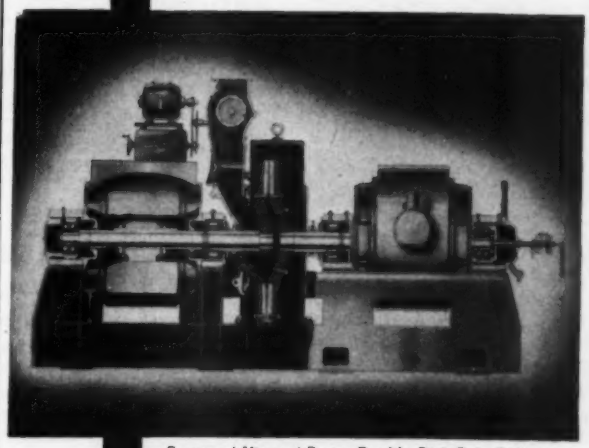
Unbleached Papers—
Com. Gr. Butch. 40 lb. —
No. 1 Butchers..... —
No. 1 Imit. Parch. & Dry Fin. Groc. Sulphite, 30 lb. ..... —
No. 2 Imit. Parch. & Dry Fin. Groc. Sulphite, 30 lb..... —
Steam Finish, 50 lb. ..... —
Water Finish, 50 lb. .. —

Manilas—
Envp. Mls., Sub. 16-40 (No. 1)..... —
Envp. Mls., Sub. 16-28 (No. 2) ..... —
Envp. Mls. (Prices based on large sheets untrim'd ream marked, in bdls.) —

Wrapp Mls. 35 lb. up—
No. 1 ..... —
No. 2 ..... —

M.G. Sulphite and Kraft (other than Waxing)
Grade B20 lb. ..... —
Grade A-22 lb. ..... —

BACKED BY 72 YEARS' EXPERIENCE



Sectional View of Bauer Double-Disk Pulp Refiner

Bauer

PULP REFINERS

You get the benefit of 72 years' disk mill manufacturing experience in Bauer Pulp Refiners. What's more, you can check the performance of Bauer machines in as many pulp and paper mills as you please. There's a lot of satisfaction in having such a background of experience upon which to base your selection of refining equipment.

Bauer Pulp Refiners are being successfully and economically used for processing almost every conceivable material employed in making wood pulp, paper, board, plastics, and roofing: raw, steamed, and cooked chips from soft and hard woods; groundwood rejects; sulphite and soda pulps; kraft knotter and screen rejects; waste paper of all kinds; bagasse, licorice root, and bamboo fibers; straw and many other agricultural residues. Dirt and pitch dispersal can be effectively done by the intensive mixing action of the double disk machine.

Ask for new bulletin P-1 and specific information. If you have unusual pulping and refining problems, you are invited to utilize our labcratory facilities.

THE BAUER BROS. CO.

Springfield 99, Ohio

Paper Industry Index to Advertisers

When writing them, please mention The Paper Industry.
Refer to the Paper and Pulp Mill Catalogue and Engineering Handbook at your mill office, for complete listing of all advertisers' products.

Acme Steel Company
American Hoist & Derrick Co. 237
Anheuser-Busch, Inc. 232
Anthracite Equipment Corporation 322
Appleton Machine Company, The
Appleton Wire Works, Inc.
Appleton Woolen Mills 246
Armstrong Machine Works
Arnold, Hoffman & Co., Inc. 338
Asten-Hill Mfg. Co.
Atkins and Company, E. C.
Aurora Pump Company

Bagley & Sewall Co., The
Bailey Meter Company
Baker & Adamson Products, General Chemical Div., Allied Chemical & Dye Corp. 254
Barrell Company, Wm. L. 249
Bauer Bros. Co., The 337
Becco Sales Corporation 231
Beloit Iron Works 291
Bird Machine Company 267
Birmingham Tank Company 293
Black-Clawson Co., The 269
Boston Woven Hose & Rubber Co.
Bowser, Incorporated
Bowsher Co., The N.P. 333

Cady and Company, E. J.
Cameron Machine Co.
Carthage Machine Co.
Chain Belt Company 248
Chicago Bridge & Iron Company 230
Clark Equipment Company, Industrial Truck Division 268
Classified Advertising 329
Coes Company, Loring 331
Continental Foundry & Machine Co. 318
Curlator Corporation 245

Darnell Corporation, Ltd.
Dempster Brothers, Inc. 240
DeZurik Shower Company 323
Dicalite Div., Great Lakes Carbon Corp. 323
Dietert Co., Harry W.
Dilts Machine Works 269
Downingtown Mfg. Co. 236
Draper Brothers Company
du Pont de Nemours & Co., E. I. 4th Cover

Eastwood-Nealley Corporation
English China Clays Sales Corp. 320

Farquhar Co., The A. B. 335
Fawick Airflex Company, Inc. 257
Federal Products Corporation
Federated Metals Division, American Smelting and Refining Company 333
Fischer & Porter Co.
Fitchburg Screen Plate Co., Inc. 325
Fleishel Lumber Company 300
Foxboro Company, The
Fritz Publications, Inc. 313, 339

Garlock Packing Co., The
General Chemical Division, Allied Chemical & Dye Corporation 254
Glidden Company, The 315
Goulds Pumps, Inc. 305

Hanchett Manufacturing Co. 317
Harrington & King Perforating Co. 316
Harris-Seybold Company 2nd Cover
Hercules Powder Company
Hills-McCanna Company
Hooper & Sons Co., Wm. E. 228
Hubinger Company, The 325
Hudson-Sharp Machine Company 335
Hunt Machine Co., Rodney 308
Huyck & Sons, F. C.

Infilco, Incorporated
Ingalls Iron Works Company 293
Insul-Mastic Corporation of America 256

Jeffrey Mfg. Co., The 3rd Cover
Jenkins Bros. 233
Jenssen Company, Inc., G. D. 333
Johnson Corporation, The 313
Jones Foundry & Machine Co., W. A. 327

Kalamazoo Tank & Silo Co.
Kelco Company 309
Koppers Company, Inc. 241
Kuhns Brothers Company, The 325

Langston Co., Samuel M.
Layne & Bowler, Inc. 331
Lewellen Manufacturing Co.
Lindsay Wire Weaving Co., The 315
Link-Belt Company 252
Lockport Felt Company
Lodding Engineering Corp.
Lunkenheimer Co., The 310

Magnus Metal Corporation
Mathieson Chemical Corporation
Michigan Steel Casting Co. 329
Midwest Piping & Supply Co., Inc.
Minneapolis-Honeywell Regulator Company, (Industrial Division) 227
Mixing Equipment Co., Inc. 321
Modern Engraving & Machine Company 264
Morden Machines Company 302
Morningstar, Nicol, Inc.
Mt. Vernon-Woodberry Mills, Inc. 243
Murray Mfg. Co., D. J. 307

Nash Engineering Co., The 323
National Aluminate Corporation 247

(Continued on facing page)

Better Chemicals for the Process Industries Since 1815

AHCO PRODUCTS

Plants: Charlotte, N. C., Cincinnati, Ohio, Dighton, Mass.

- **Defoamers**
- **Eveners**
- **Softeners**
- **Sulphonated Oils**
- **Wetting and re-wetting agents for wet-strength papers**

For samples and research bulletins, contact your nearest AHCO office

ARNOLD-HOFFMAN
PROVIDENCE, RHODE ISLAND

Arnold, Hoffman & Co. Incorporated • Est. 1815 • Providence, Rhode Island
Offices: Charlotte; Cincinnati; New York; Philadelphia; Providence

National Safety Council, Inc. 327
Naylor Pipe Company .....
Norton Company .....
Nugent & Company, Inc., Wm. W. 313

Ohio Injector Co., The .....
Oliver United Filters, Inc. .....
Owen Bucket Company, The 335

Paisley Products, Inc. .....
Palmer Filter Equipment Company 322
Paper & Industrial Appliances, Inc. 336
Perfecting Service Company .....
Perkins & Son, Inc., B. F. 294
Permutit Company, The 329
Pittsburgh Piping & Equipment Co. 244
Poole Foundry & Machine Co. 315
Powell Company, The Wm. 238
Pusey & Jones Corp., The 262, 263

Rice Barton Corporation .....
Rice Barton Research Corp. .....
Rogers & Co., Samuel C. 329
Rohm & Haas Company, Resinous Products Division .....
Roots-Connersville Blower Corp. 319
Ross Heater & Mfg. Co., Inc. .....
R-S Products Corporation 301

Sandusky Foundry & Machine Co. .....
Sandy Hill Iron & Brass Works, The 242
Shartle Bros. Machine Co. 269
Shuler & Benninghofen 234
SKF Industries, Inc. 299
Smith & Winchester Mfg. Co. .....
Smith Corporation, A. O. 239
Solvay Sales Division, Allied Chemical & Dye Corporation 333
Standard Oil Co. (Indiana) 297
Stein, Hall & Company, Inc. .....
Stickle Steam Specialties Co. .....
Sutherland Refiner Corporation 250
Swenson Evaporator Company ..... 1st Cover

Titanium Pigment Corporation .....
Torrington Co., Bantam Bearings Division .....
Turner Halsey Company 243

U.S.A.—Treasury Dept. .....

Valley Iron Works Company 340
Vanderbilt Co., Inc., R. T. .....

Waterbury & Sons Co., H. 316
Waterbury Felt Co., The 325
Western Precipitation Corp. .....
Weyerhaeuser Timber Co. 235
Whiting Corporation ..... 1st Cover
Williams-Gray Company .....
Worthington Pump & Machinery Corp. .....
Wyandotte Chemicals Corporation .....

Yarnall-Waring Company .....
Youngstown Welding & Engineering Co., The 331

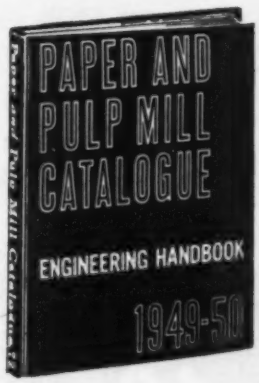
Professional & Business Services Section
Bjorksten Research Laboratories .....
Clark & Company, Wallace 334
Cohan, W. B. 334
Dreshfield, Arthur C. 334
Guest & Sons, C. M. .....
Wierk, Frederick 334

The 1949-50 Edition . . .

PAPER AND PULP MILL CATALOGUE

Engineering Handbook

is in your mill office



The following firms catalogue their products in the 1949-50 edition.

Adell Chemical Company
Allington & Curtis Mfg. Co., The
Allis-Chalmers Mfg. Company
American Cyanamid Co. (Industrial Chemicals Div.)
American Defibrator, Inc.
American Paper Mach'y & Engr. Wks., Inc.
Appleton Machine Co., The
Armour and Company & Subsidiaries
Armstrong Machine Works
Arrow Tank Company, Inc.
Atkins and Company, E. C.
Aurora Pump Company

Bagley and Sewall Co., The
Bauer Bros. Company, The
Becco Sales Corporation
Beloit Iron Works
Bird Machine Company
Black-Clawson Co., The
Blaw-Knox Division (Blaw-Knox Co.)
Bowser, Inc.
Buckman Laboratories, Inc.
Buffalo Forge Company
Buffalo Pumps, Inc.
Bulkley, Dunton Pulp Co., Inc.

Cameron Machine Company
Carthage Machine Company
Cash Company, A. W.
Chemipulp Process, Inc.
Chicago Bridge & Iron Co.
Cincinnati Grinders Inc.
Cincinnati Milling Machine Co., The
Continental Foundry & Machine Company

Dean Brothers Pumps, Inc.
Dean Hill Pump Company
DeLaval Steam Turbine Co.
DeZurik Shower Company
Dilts Machine Works
Downingtown Mfg. Co.
Dresser Industries, Inc.
Duriron Co., Inc., The

Electric Steel Foundry
English China Clays Sales Corp.

Falk Corporation, The
Farrel-Birmingham Co., Inc.
Fitchburg Screen Plate Co., Inc.
Fleishel Lumber Company
Foote Bros. Gear and Machine Corporation
Foster Wheeler Corporation
Foxboro Company, The

Garlock Packing Co., The
General American Transportation Corporation
Gibbs-Brower Company, Inc.
Glens Falls Machine Works, Inc.
Goslin-Birmingham Manufacturing Co., Inc.
Graver Tank & Manufacturing Co., Inc.
Graver Water Conditioning Co.
Gruendler Crusher & Pulverizer Company
Gwilliam Company, The

Hardinge Company, Inc.
Harris-Seybold Company
Hauser-Stander Tank Co., The
Hendrick Mfg. Co.
Hermann Mfg. Co., The
Hewitt Machine Co., J. W.
Hewitt Transmission Co.
Hills-McCanna Company
Holyoke Machine Company
Hudson-Sharp Machine Co.
Huss Lumber Company

Improved Paper Machinery Corporation
Infilco Inc.

James Gear Mfg. Co., D. O.
Jeffrey Mfg. Co., The
Johns-Manville
Johnson & Carlson
Johnson Corporation, The
Jones & Sons Company, E. D.
Jones Foundry & Machine Co., W. A.
Joy Manufacturing Company

Kalamazoo Tank & Silo Co.
Kingsford Foundry & Machine Works

Ladish Co.
Langston Co., Samuel M.

Lawrence Machine & Pump Corporation
Leader Iron Works, Inc.
Link-Belt Company

Mason-Neilan Regulator Co.
Maxson Automatic Mach. Co.
Merrick Scale Mfg. Co.
Michigan Pipe Company
Midwest-Fulton Machine Co.
Moore & White Co., The
Morris Machine Works
Moyno Pump Div., Robbins & Myers, Inc.
Murray Mfg Co., D. J.

National Aluminate Corp.
Naylor Pipe Company
Nichols Engineering & Research Corp.
Noble & Wood Machine Co., The
Northern Engineering Works

Ohio Grease Company, The

Paper and Industrial Appliances, Inc.
Perfecting Service Company
Perkins & Son, Inc., B. F.
Portland Copper & Tank Works, Inc.
Posey Iron Works, Inc.
Pusey & Jones Corp., The

Record Foundry & Mach. Co.
Research Corporation
Rice Barton Corporation
Rice Barton Research Corp.
Robbins & Myers, Inc.
Ronningen Engineering Sales
Roofing Machinery Mfg. Co.
Roots-Connersville Blower Corp.
Ross Engineering Corp., J. O.
R-S Products Corporation

Sandy Hill Iron & Brass Works, The
Sarco Company, Inc.
Seybold Division, Harris-Seybold Company
Shartle Bros. Machine Co.
Simpson Co., The Orville
Smith Corporation, A. O.
Spraying Systems Company
Sprout, Waldron & Company
Stebbins Eng. & Mfg. Co.
Swenson Evaporator Company
Syco Manufacturing Corp.

Taylor-Stiles & Company
Toledo Scale Company
Trimbey Machine Works
Tube Turns, Inc.

Valley Iron Works Company

Waldron Corporation, John
Wallace & Tiernan Co., Inc.
Warren Steam Pump Co.
Whiting Corporation
Wiley Alloy Tube Company

Yarnall-Waring Company

Mention the PAPER AND PULP MILL CATALOGUE *when making inquiries.*

Published by

Fritz Publications, Inc.

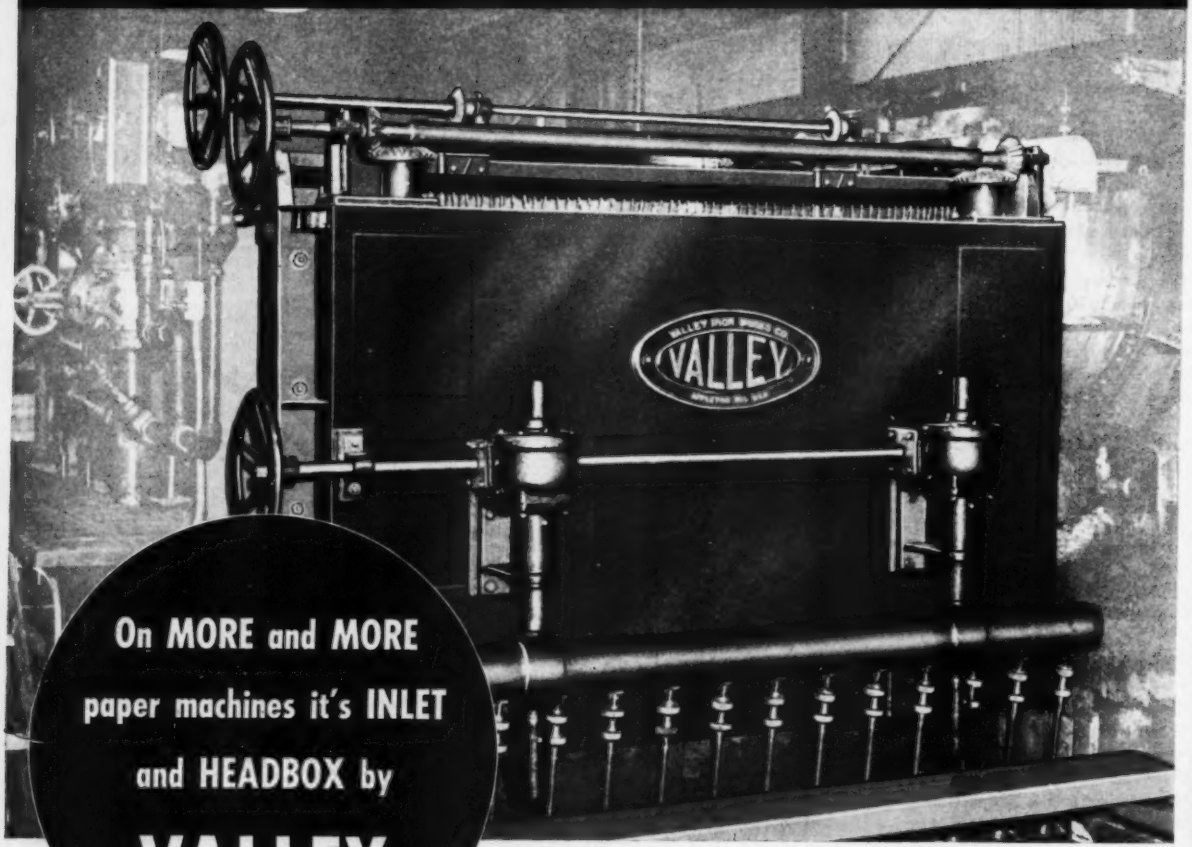
59 East Van Buren Street — Chicago 5, Illinois

Also publishers of THE PAPER INDUSTRY.

ANOTHER NEW INLET AND HEADBOX BY VALLEY

ON NO. 3 MACHINE AT
LONGVIEW FIBRE CO.
LONGVIEW, WASHINGTON

For a Complete Speed Range of
1200 FPM down to 250 FPM

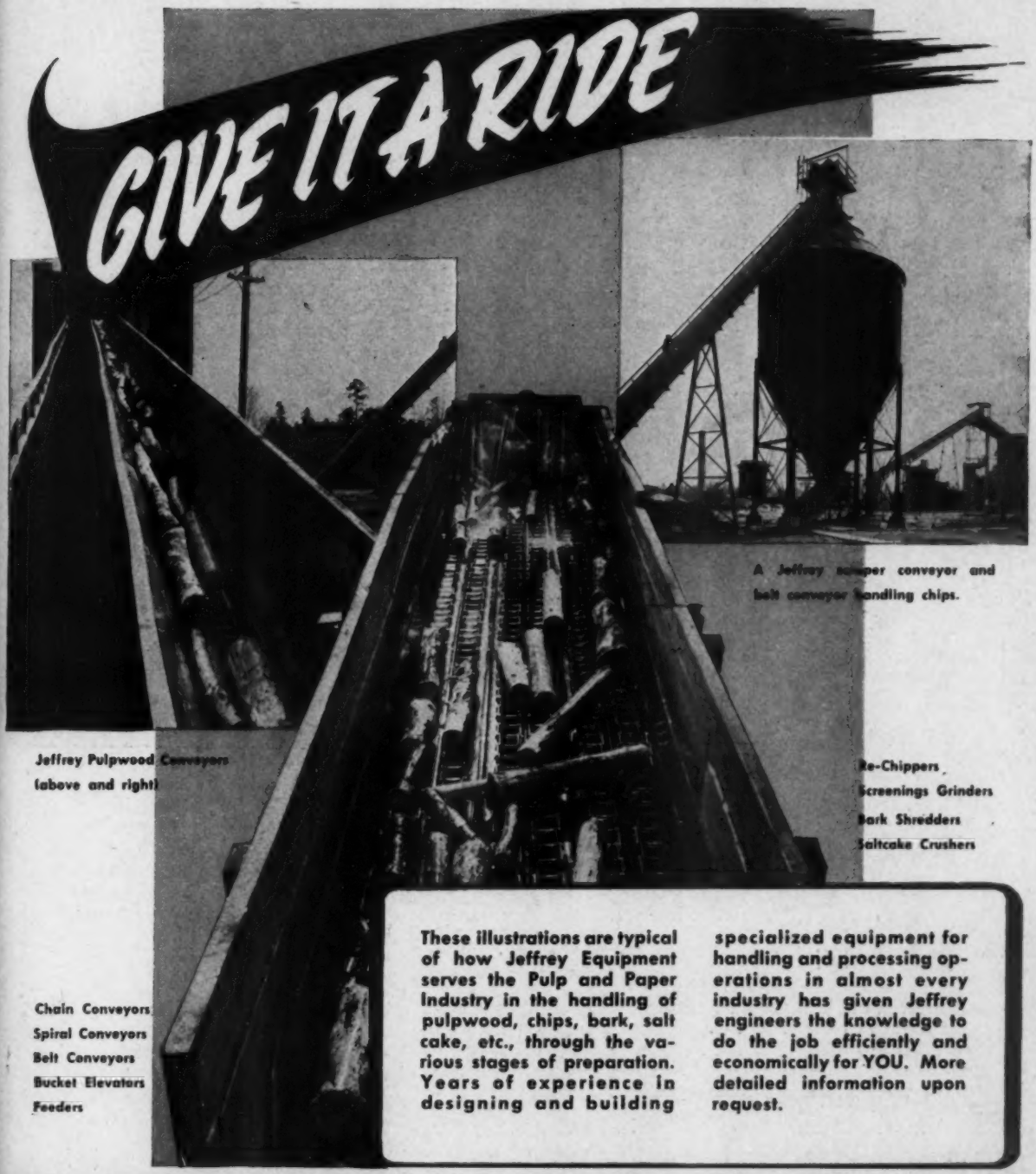


On MORE and MORE paper machines it's INLET and HEADBOX by VALLEY

VALLEY IRON WORKS CO.
Appleton, Wisconsin

FORMATION CALIPER LEVEL SHEET INCREASED SPEED HIGHER TEST

GIVE IT A RIDE



A Jeffrey scraper conveyor and belt conveyor handling chips.

Jeffrey Pulpwood Conveyors (above and right)

Re-Chippers
Screenings Grinders
Bark Shredders
Saltcake Crushers

Chain Conveyors
Spiral Conveyors
Belt Conveyors
Bucket Elevators
Feeders

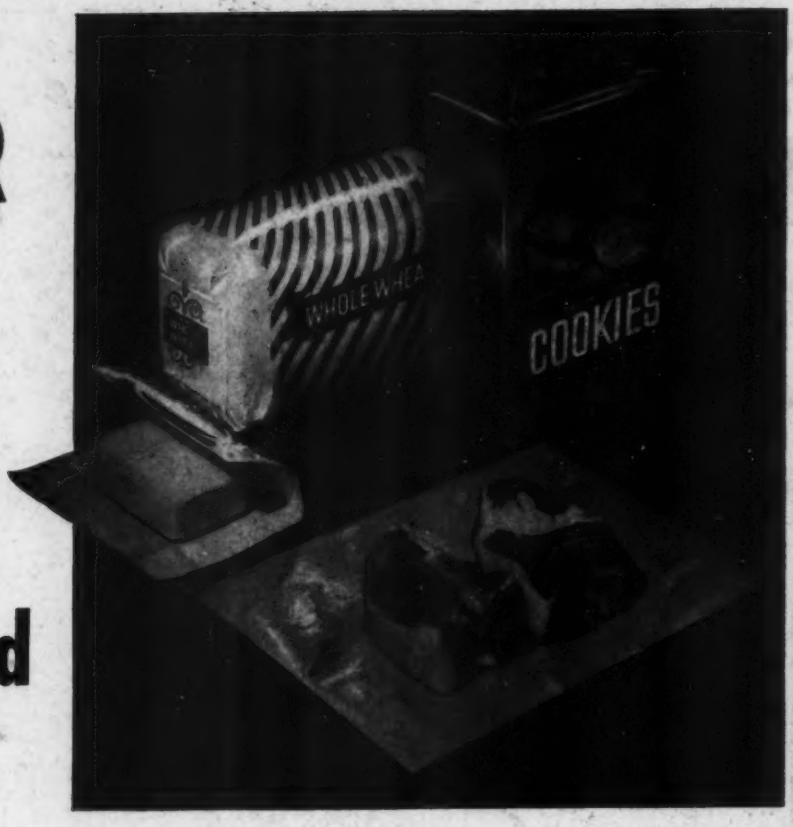
These illustrations are typical of how Jeffrey Equipment serves the Pulp and Paper Industry in the handling of pulpwood, chips, bark, salt cake, etc., through the various stages of preparation. Years of experience in designing and building specialized equipment for handling and processing operations in almost every industry has given Jeffrey engineers the knowledge to do the job efficiently and economically for YOU. More detailed information upon request.

JEFFREY

Complete Line of Material Handling, Processing and Mining Equipment

ESTABLISHED 1877

GREATER SALES APPEAL for your wax-coated papers . . .



Just a small percentage of "Alathon" Polythene Resin added to wax gives your papers a tougher, more brilliant coating with increased grease resistance. Papers coated with these blends have greater freedom from blocking. The coating stays more flexible at low temperatures.

You'll find your papers have much more sales appeal. There's a ready market for these improved coatings for bread, soap and frozen-food wrappers, locker paper, cake boards, butter cartons and many other paper products. Best of all, you can easily apply "Alathon" and wax blends to your paper with your present equipment.

Make sure you get complete information about Du Pont "Alathon" Polythene Resins . . . write today for free booklet. It contains data and suggested uses for these versatile paper-coating materials. Du Pont Technical Representatives will be glad to work with you.

OPEN NEW MARKETS WITH PURE "ALATHON" COATINGS

Papers with pure "Alathon" coatings can be used where paper could never be used before. "Alathon" coatings make your paper resistant to:

WATER	SOLVENTS
ACIDS	FERTILIZERS
ALKALIS	OILS

SURFACE ACTIVE AGENTS

Du Pont "Alathon" Polythene Resins also give paper a tough, brilliant finish that stays flexible at extremes of temperature. Think of how "Alathon" paper coatings can expand your present markets . . . and develop new ones!

DU PONT
REG. U.S. PAT. OFF.
BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

ALATHON
(TRADE MARK)
Another Product for the Paper Industry from

Polychemicals DEPARTMENT
E. I. DU PONT DE NEMOURS & CO. (INC.), WILMINGTON 98, DELAWARE

TECHNOLOGY DEPT

JULY 1950